

637334

REPORT NUMBER 214-GTL-04-003

**SAFETY COMPLIANCE TESTING FOR  
FMVSS NO. 214S  
SIDE IMPACT PROTECTION (STATIC)**

**GENERAL MOTORS CORP.  
2004 CHEVROLET MALIBU, PASSENGER CAR  
NHTSA NO. C40102**

**GENERAL TESTING LABORATORIES, INC.  
1623 LEEDSTOWN ROAD  
COLONIAL BEACH, VIRGINIA 22443**



**SEPTEMBER 14, 2004**

**FINAL REPORT**

**PREPARED FOR**

**U. S. DEPARTMENT OF TRANSPORTATION  
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION  
ENFORCEMENT  
OFFICE OF VEHICLE SAFETY COMPLIANCE  
400 SEVENTH STREET, SW  
ROOM 6111 (NVS-220)  
WASHINGTON, D.C. 20590**

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Approval Date: 9/14/04

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| 15. Supplementary Notes   |  |                                   |  |  |
| 16. Abstract<br>Compliance tests were conducted on the subject 2004 Chevrolet Malibu Passenger Car in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-214S-05 for the determination of FMVSS 214 compliance.<br>Test failures identified were as follows:<br>NONE |  |                                   |  |  |
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## SECTION 1 INTRODUCTION

### 1.0 PURPOSE OF COMPLIANCE TEST

A 2004 Chevrolet Malibu 4-door passenger car was subjected to Federal Motor Vehicle Safety Standard (FMVSS) No. 214 testing to determine if the vehicle was in compliance with the requirements of the standard. FMVSS No. 214 establishes requirements for the side doors of a Motor Vehicle to minimize the safety hazard caused by intrusion into the passenger compartment as a result of a side impact accident.

### 1.1 TEST VEHICLE

The test vehicle was a 2004 Chevrolet Malibu 4-door passenger car. Nomenclature applicable to the test vehicle are:

- A. Vehicle Identification Number: 1G1ZT52814F125082
- B. NHTSA No.: C40102
- C. Manufacturer: GENERAL MOTORS CORPORATION
- D. Manufacture Date: 10/03

The vehicle's front and rear seating systems were removed for this test. All vehicle windows were closed and all doors were locked for this test.

### 1.2 TEST DATE

The test vehicle was subjected to FMVSS No. 214 testing on September 1, 2004.

## SECTION 2 TEST PROCEDURE AND SUMMARY OF RESULTS

### 2.0 TEST PROCEDURE

All tests were conducted in accordance with NHTSA, Office of Vehicle Safety Compliance (OVSC) Laboratory Procedure, TP-214S-05 dated 14 September 1993 and General Testing Laboratories, Inc. (GTL) Test Procedure, TP-214S-05, "Static – Side Impact Protection".

Each vehicle shall be able to meet the requirements of either, at the manufacturer's option, 2.1 or 2.2 when any of its side doors that can be used for occupant egress are tested.

### 2.1 OPTION ONE

With any seats that may affect load upon or deflection of the side of the vehicle removed from the vehicle, each vehicle must be able to meet the requirements of 2.1.1 through 2.1.3.

#### 2.1.1 INITIAL CRUSH RESISTANCE

The initial crush resistance shall not be less than 2,250 pounds.

#### 2.1.2 INTERMEDIATE CRUSH RESISTANCE

The intermediate crush resistance shall not be less than 3,500 pounds.

#### 2.1.3 PEAK CRUSH RESISTANCE

The peak crush resistance shall not be less than two times the curb weight of the vehicle or 7,000 pounds, whichever is less.

### 2.2 OPTION TWO

With seats installed in the vehicle, and located in any horizontal or vertical position to which they can be adjusted and at any seat back angle to which they can be adjusted, each vehicle must be able to meet the requirements of 2.2.1 through 2.2.3.

#### 2.2.1 INITIAL CRUSH RESISTANCE

The initial crush resistance shall not be less than 2,250 pounds.

#### 2.2.2 INTERMEDIATE CRUSH RESISTANCE

The intermediate crush resistance shall not be less than 4,375 pounds.

## SECTION 2 CONTINUED

2.2.3 PEAK CRUSH RESISTANCE

The peak crush resistance shall not be less than three and one half times the curb weight of the vehicle or 12,000 pounds, whichever is less.

SECTION 3  
COMPLIANCE TEST DATA

DATA SHEET 1  
TEST VEHICLE RECEIVING-INSPECTION

VEH. MOD YR/MAKE/MODEL/BODY: 2004 CHEVROLET MALIBU PASSENGER CAR  
 VEH. NHTSA NO.: C40102 ; VIN: 1G1ZT52814F125082  
 VEH. BUILD DATE: 10/03 ; TEST DATE: SEPTEMBER 1, 2004  
 TEST LABORATORY: GENERAL TESTING LABS  
 OBSERVERS: G. FARRAND, J. LATANE

A. First compliance test by laboratory for this vehicle is the static FMVSS 214 test.

     Yes   X   No (Go to item 2)

 X  (1) Label test vehicle with NHTSA Number

 X  (2) Verify all options on the "window sticker" are present on the vehicle

 X  (3) Verify tires and wheel rims are new and the same as listed

 X  (4) Verify there are no dents or other interior or exterior flaws

 X  (5) Verify the glove box contains an owner's manual, warranty document, consumer information, and extra keys

 X  (6) Verify the vehicle is equipped with the proper fuel filler cap

 X  (7) If the vehicle has been delivered from the dealer, verify the vehicle has been properly prepared and is in running condition

B. Verify seat adjusters are working

 X  Yes      No

C. Verify there is a seat belt at each seating position

 X  Yes      No

D. Without disturbing the integrity of each seat belt and anchorage, verify that each seat belt is attached to the anchorage. For seat belts that are attached to the seat, also verify the seats are attached to the seat anchors and the seat anchors are attached to the vehicle.

 X  Yes      No

E. Curb Weight of Vehicle:   3261   LBS.

F. COMMENTS: (Explain any problems here)

RECORDED BY: 

DATE:   09/01/04  

APPROVED BY: 

# DATA SHEET 2 PRETEST PREPARATION

VEH. MOD YR/MAKE/MODEL/BODY: 2004 CHEVROLET MALIBU PASSENGER CAR  
 VEH. NHTSA NO.: C40102 ; VIN: 1G1ZT52814F125082  
 VEH. BUILD DATE: 10/03 ; TEST DATE: SEPTEMBER 1, 2004  
 TEST LABORATORY: GENERAL TESTING LABS  
 OBSERVERS: G. FARRAND, J. LATANE

Prior to testing the following will be accomplished:

|  | <u>TEST</u> |              |
|--|-------------|--------------|
|  | 1           | 2            |
| A. Check the manufacturers certification statement to determine if the vehicle should be tested with or without seats installed.   | <u>X</u>    | <u>X</u>     |
| B. Remove all seats unless the vehicle has been certified with the seats installed. If the seats remain in the vehicle, they are to be adjusted per the COTR's instructions. | <u>X</u>    | <u>X</u>     |
| C. Close all windows   | <u>X</u>    | <u>X</u>     |
| D. Lock All doors  | <u>X</u>    | <u>X</u>     |
| E. State door tested   | <u>LF</u>   | <u>RR</u>    |
| F. State the length of a horizontal line drawn on door through a point 5 inches vertically above lowest point of test door   | <u>42.2</u> | <u>27.5</u>  |
| G. State vertical distance from the lowest part of test door to bottom of loading device   | <u>5"</u>   | <u>5"</u>    |
| H. State position of vertical centerline of loading device on the midpoint of line determined step F   | <u>21.1</u> | <u>13.25</u> |
| I. Determine that the vertical axis of the loading device is perpendicular to the longitudinal and lateral axis of the test vehicle  | <u>X</u>    | <u>X</u>     |
| J. Determine that the top of the loading device is above the door window opening but not touching any structure above the window opening                                     | <u>X</u>    | <u>X</u>     |

RECORDED BY: 

DATE: 08/31/04

APPROVED BY: 

DATA SHEET 3  
STATIC LOAD TEST - BACK-UP SYSTEM DATA

VEH. MOD YR/MAKE/MODEL/BODY: 2004 CHEVROLET MALIBU PASSENGER CAR  
 VEH. NHTSA NO.: C40102 ; VIN: 1G1ZT52814F125082  
 VEH. BUILD DATE: 10/03 ; TEST DATE: SEPTEMBER 1, 2004  
 TEST LABORATORY: GENERAL TESTING LABS  
 OBSERVERS: G. FARRAND, J. LATANE

**RESULTS:** Plots of load versus displacement and time versus displacement obtained from the back-up data (attach plots to data sheet) showed that:

**TEST #1 - GTL #5246 (LEFT FRONT DOOR)**

- A. The initial crush resistance was 3059 lbs.  
 B. The intermediate crush resistance was 5697 lbs.  
 C. The peak crush resistance was 11,495 lbs at 12.003 inches  
 D. The rate of loading was .2"/sec

The dial indicator and the inclinometer showed the following deflections.

| LOADING DEVICE TRAVEL              | DIAL INDICATOR | INCLINOMETER |
|------------------------------------|----------------|--------------|
| 0 inches                           | <u>0.0000</u>  | <u>0</u>     |
| 2 inches                           | <u>0.0279</u>  | <u>0</u>     |
| 4 inches                           | <u>0.1432</u>  | <u>0</u>     |
| 6 inches                           | <u>0.1823</u>  | <u>0</u>     |
| 12 inches                          | <u>0.6021</u>  | <u>0</u>     |
| <u>12.003</u> Inches (full travel) | <u>0.6088</u>  | <u>0</u>     |

**TEST #2 - GTL #5247 (RIGHT REAR DOOR)**

- A. The initial crush resistance was 3674 lbs.  
 B. The intermediate crush resistance was 6211 lbs.  
 C. The peak crush resistance was 11,509 lbs at 12.761 inches  
 D. The rate of loading was .2"/sec

DATA SHEET 3 CONTINUED  
STATIC LOAD TEST - BACK-UP SYSTEM DATA

The dial indicator and the inclinometer showed the following deflections.

| LOADING DEVICE TRAVEL              | DIAL INDICATOR | INCLINOMETER |
|------------------------------------|----------------|--------------|
| 0 inches                           | <u>0.0000</u>  | <u>0</u>     |
| 2 inches                           | <u>0.0285</u>  | <u>0</u>     |
| 4 inches                           | <u>0.0340</u>  | <u>0</u>     |
| 6 inches                           | <u>0.0685</u>  | <u>0</u>     |
| 12 inches                          | <u>0.4043</u>  | <u>0</u>     |
| <u>12.761</u> Inches (full travel) | <u>0.4043</u>  | <u>0</u>     |

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DATE: 09/01/04

APPROVED BY: 



DATA SHEET 4  
DATA REDUCTION

VEH. MOD YR/MAKE/MODEL/BODY: 2004 CHEVROLET MALIBU PASSENGER CAR  
VEH. NHTSA NO.: C40102 ; VIN: 1G1ZT52814F125082  
VEH. BUILD DATE: 10/03 ; TEST DATE: SEPTEMBER 1, 2004  
TEST LABORATORY: GENERAL TESTING LABS  
OBSERVERS: G. FARRAND, J. LATANE

Data from the primary data systems will be analyzed and the plots attached to the data sheet.

RESULTS - The load versus displacement plot showed that - -

**TEST #1** - GTL #5246 (LEFT FRONT DOOR)

- A. The initial crush resistance was 3059 lbs.  
B. The intermediate crush resistance was 5697 lbs.  
C. The peak crush resistance was 11,495 lbs at 12.003 inches

The time versus displacement plot showed that - -

The rate of loading was .2"/sec

**TEST #2** - GTL #5247 (RIGHT REAR DOOR)

- A. The initial crush resistance was 3674 lbs.  
B. The intermediate crush resistance was 6211 lbs.  
C. The peak crush resistance was 11,509 lbs at 12.761 inches

The time versus displacement plot showed that - -

The rate of loading was .2"/sec

Comparison of the ABOVE DATA with the BACKUP DATA indicates the following - -

All data was the same.

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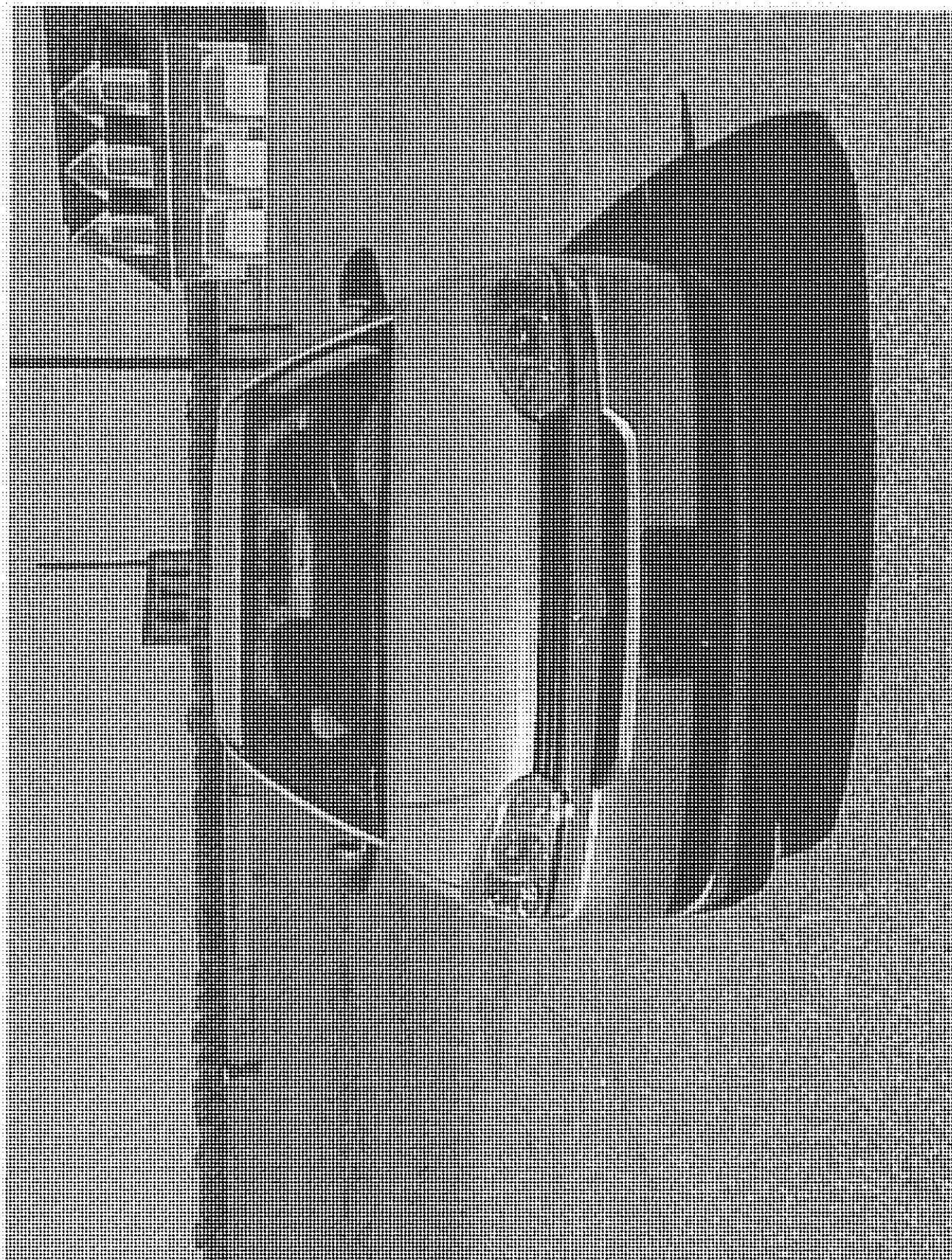
DATE: 09/01/04

APPROVED BY: 

SECTION 4  
TEST EQUIPMENT LIST

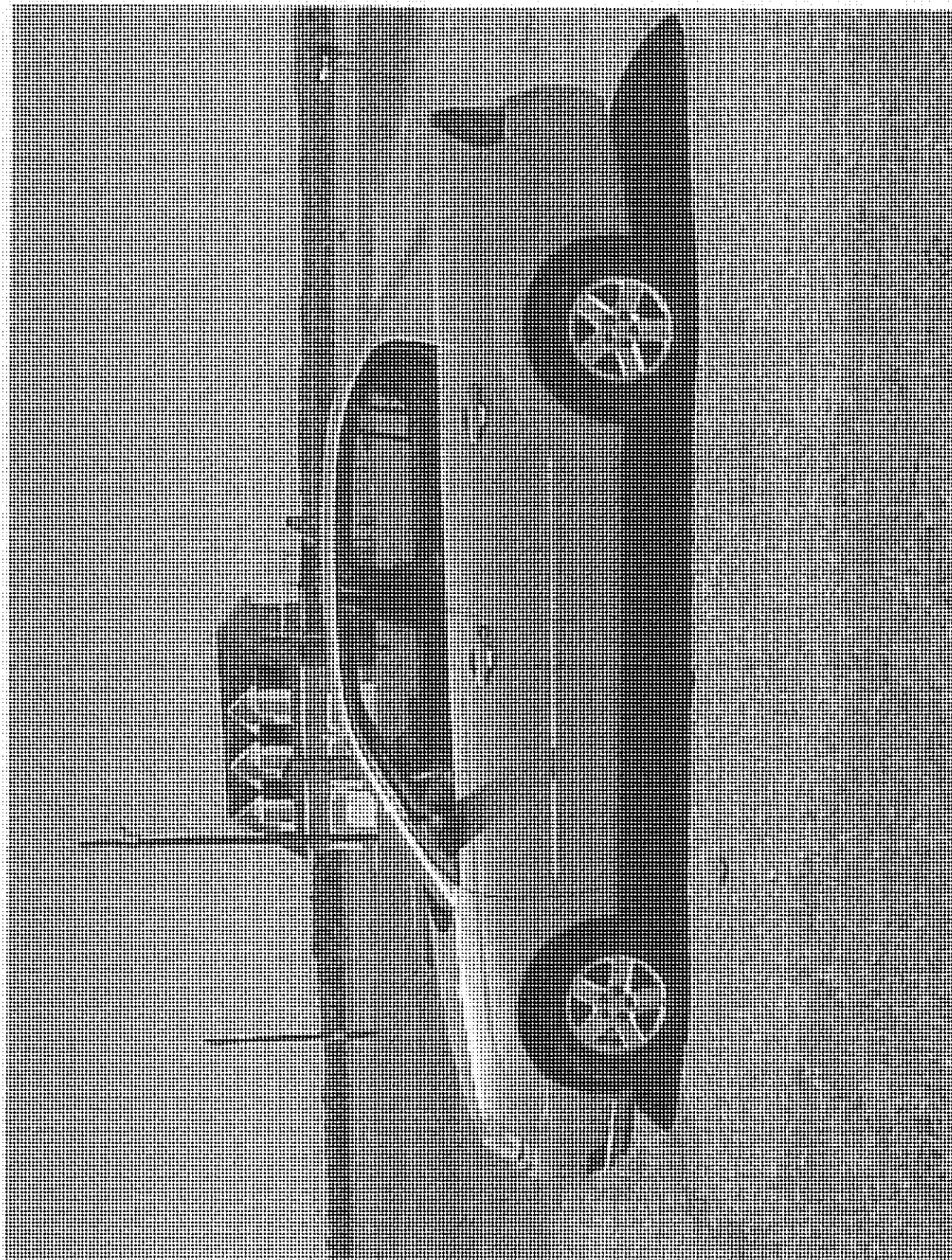
| EQUIPMENT             | DESCRIPTION        | MODEL/<br>SERIAL NO. | CAL. DATE      | NEXT CAL.<br>DATE |
|-----------------------|--------------------|----------------------|----------------|-------------------|
| COMPUTER              | AT&T               | 486DX266             | N/A            | N/A               |
| TEST FIXTURE          | GTL 220            | 220                  | N/A            | N/A               |
| A/D INTERFACE         | METRABYTE          | DAS-16(F)            | BEFORE<br>USE  | BEFORE<br>USE     |
| SCALES                | FAIRBANKS          | N/A                  | BEFORE<br>USE  | BEFORE<br>USE     |
| SIGNAL<br>CONDITIONER | METRABYTE          | EXP-RES              | BEFORE<br>USE  | BEFORE<br>USE     |
| LOAD CELLS            | REVERE<br>REVERE   | 544351A<br>544551B   | 11/03<br>11/03 | 11/04<br>11/04    |
| LINEAR POT.           | WALDALE<br>WALDALE | 123456A<br>123456B   | BEFORE<br>USE  | BEFORE<br>USE     |
| INCLINOMETER          | STARRETT           | 360/002              | 02/04          | 02/05             |
| DIAL INDICATOR        | MIOTO              | 0001-2               | BEFORE<br>USE  | BEFORE<br>USE     |

SECTION 5  
PHOTOGRAPHS



2004 CHEVROLET MALIBU  
NHTSA NO. C40102  
FMVSS NO. 214

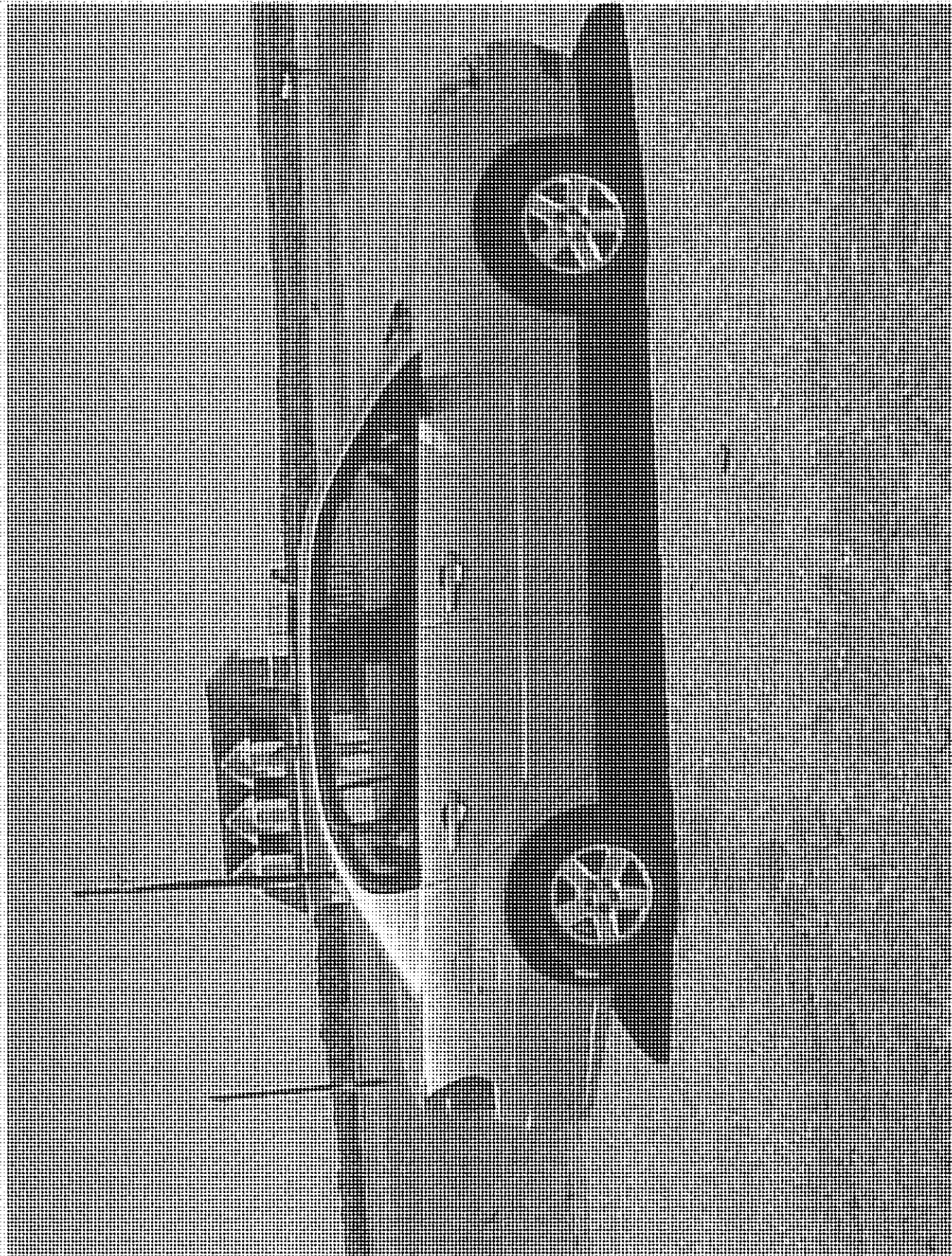
FIGURE 5.1  
FRONT VIEW OF VEHICLE PRE-TEST



2004 CHEVROLET MALIBU  
NHTSA NO. C40102  
FMVSS NO. 214

FIGURE 3.2  
LEFT SIDE VIEW OF VEHICLE PRE-TEST





2004 CHEVROLET MALIBU  
NHTSA NO. C40102  
FMVSS NO. 214

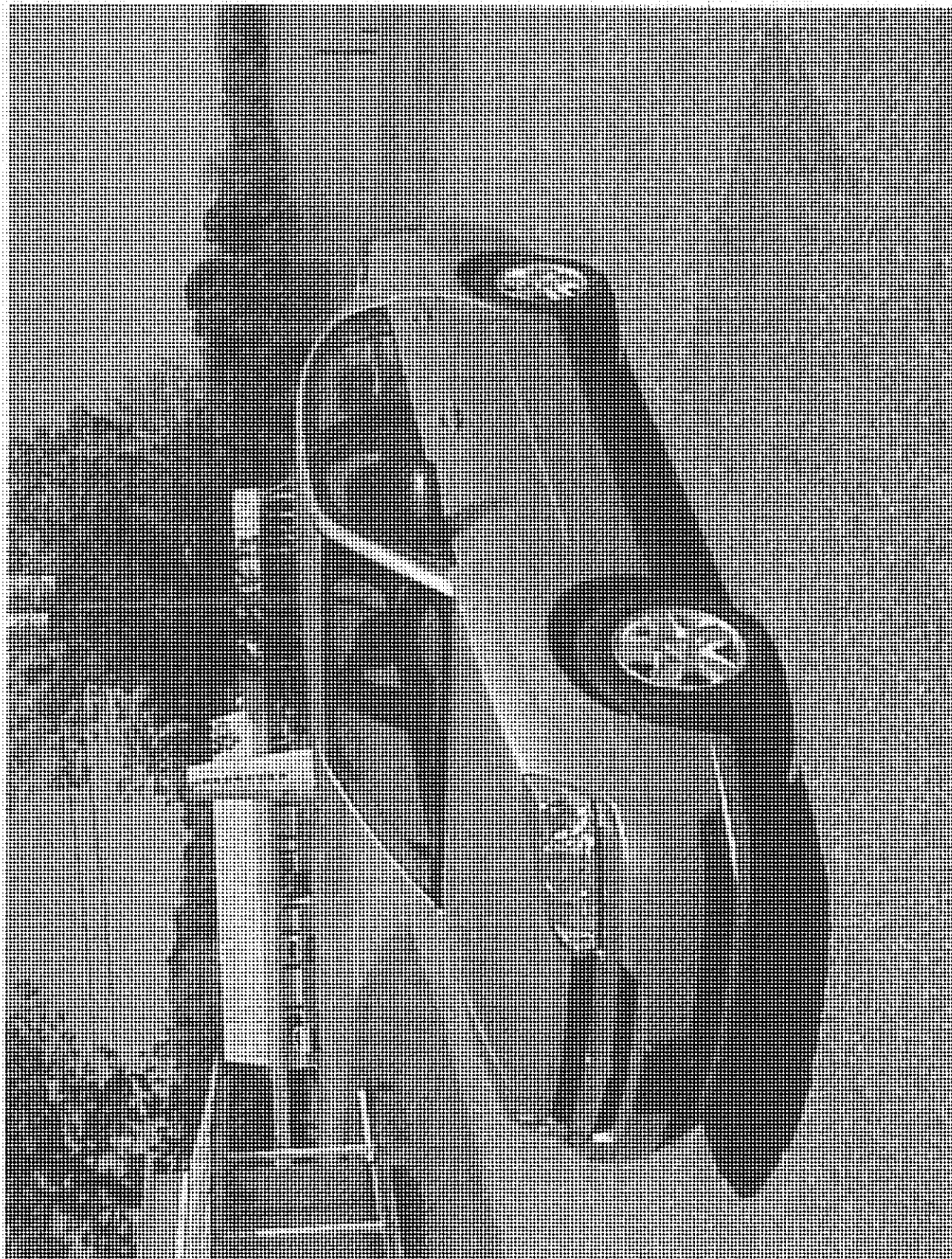
FIGURE 6.3  
RIGHT SIDE VIEW OF VEHICLE PRE-TEST



2004 CHEVROLET MALIBU  
NHTSA NO. C40102  
FMVSS NO. 214

FIGURE 5.4  
REAR VIEW OF VEHICLE PRE-TEST

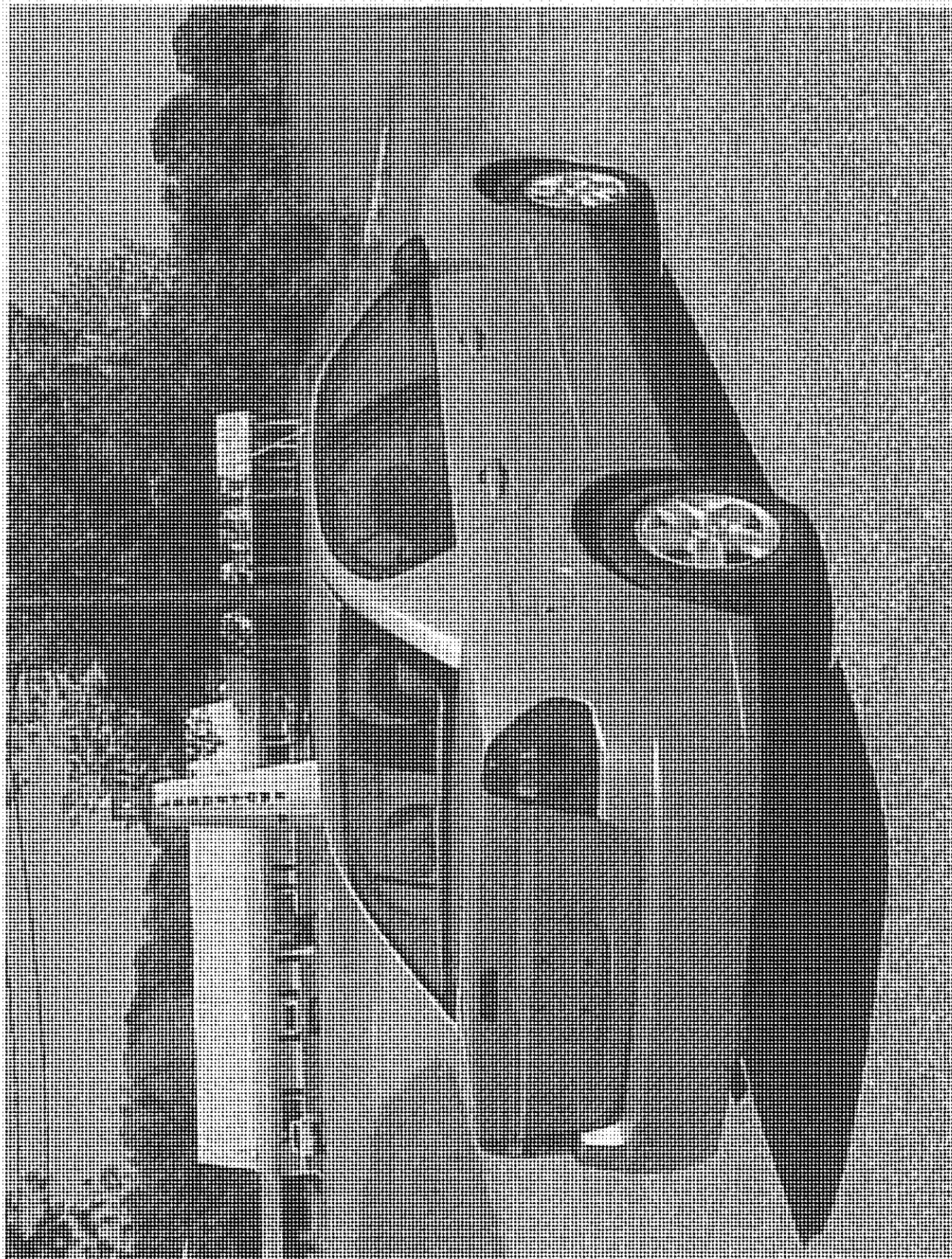




2004 CHEVROLET MALIBU  
NHTSA NO. C-40102  
FMVSS NO. 214

FIGURE 5.5  
¾ FRONTAL VIEW FROM LEFT SIDE OF  
VEHICLE PRE-TEST





2004 CHEVROLET MALIBU  
NHTSA NO. C40102  
FMVSS NO. 214

FIGURE 5.6  
¾ REAR VIEW FROM RIGHT SIDE OF  
VEHICLE PRE-TEST



MAF BY GENERAL MOTORS CORP

DATE 10/03

GVWR

1914 KG

4221 LB

GAWR FR

1021 KG

2251 LB

GAWR RR

893 KG

1970 LB

THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR  
VEHICLE SAFETY, BUMPER, AND TIRE PREVENTION STANDARDS IN  
EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE

1G1ZT520145125102

TYPE-PASS CAR

2004 CHEVROLET MALIBU  
NHTSA NO. C46102  
FMVSS NO. 214

FIGURE 6.7  
VEHICLE CERTIFICATION LABEL

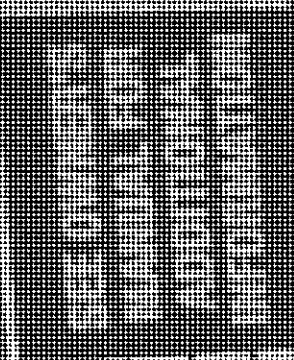




# TIRE AND LOADING INFORMATION

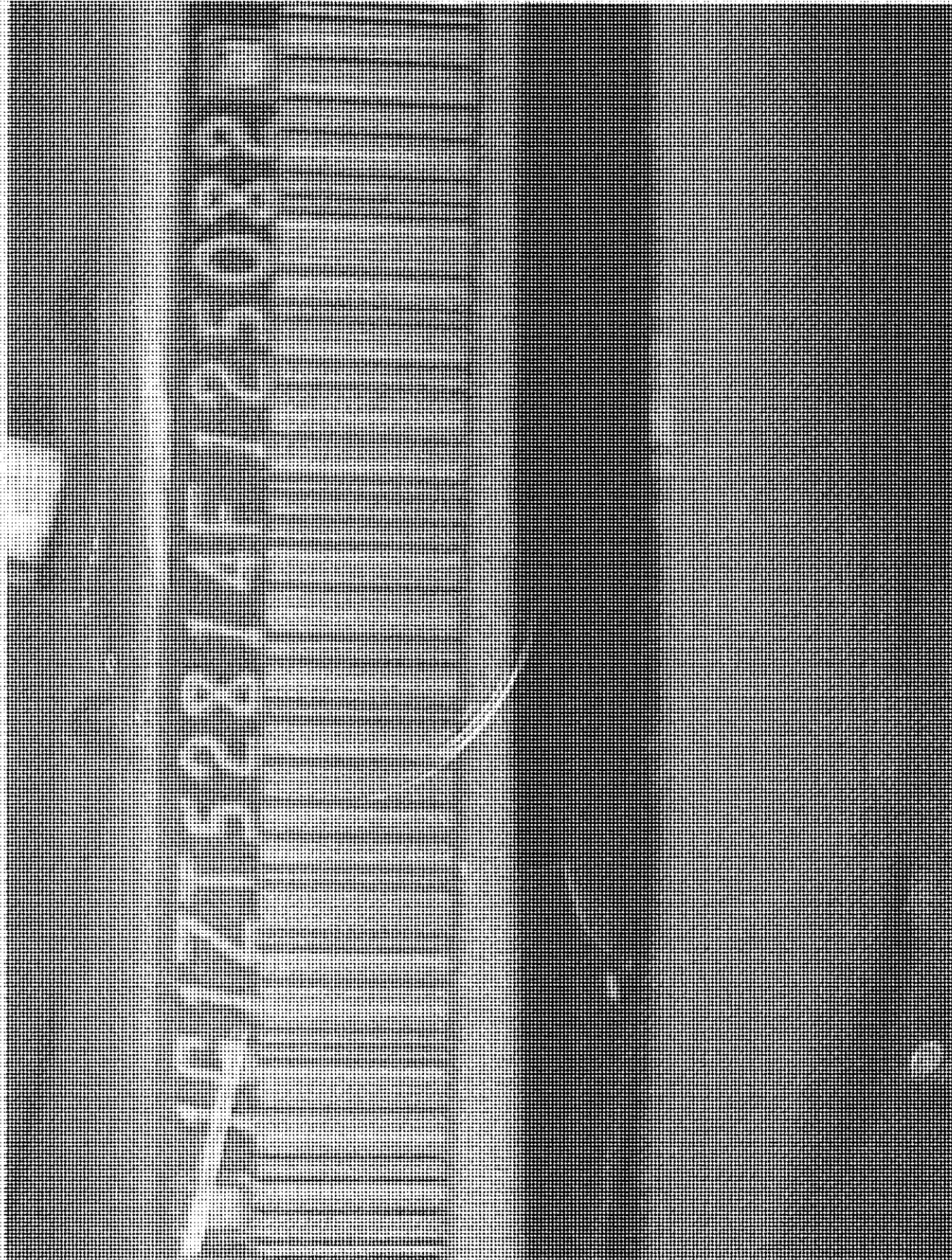
LOADING CAPACITY TOTAL 5 FRONT 2 CENTER 1 REAR 2  
EXCEEDING THESE LIMITS MAY CAUSE DAMAGE TO VEHICLE AND INFLATION PRESSURE

| ORIGINAL TIRE SIZE |       | INFLATION PRESSURE |  |
|--------------------|-------|--------------------|--|
| FRONT              |       | COLD TIRE          |  |
| P205/65R15         | FRONT | 210 KPA 30 PSI     |  |
| P205/65R15         | REAR  | 210 KPA 30 PSI     |  |
| P205/65R15         | SPARE | 210 KPA 30 PSI     |  |



2006 CHEVROLET MALIBU  
NHTSA NO. C40102  
FMVSS NO. 214

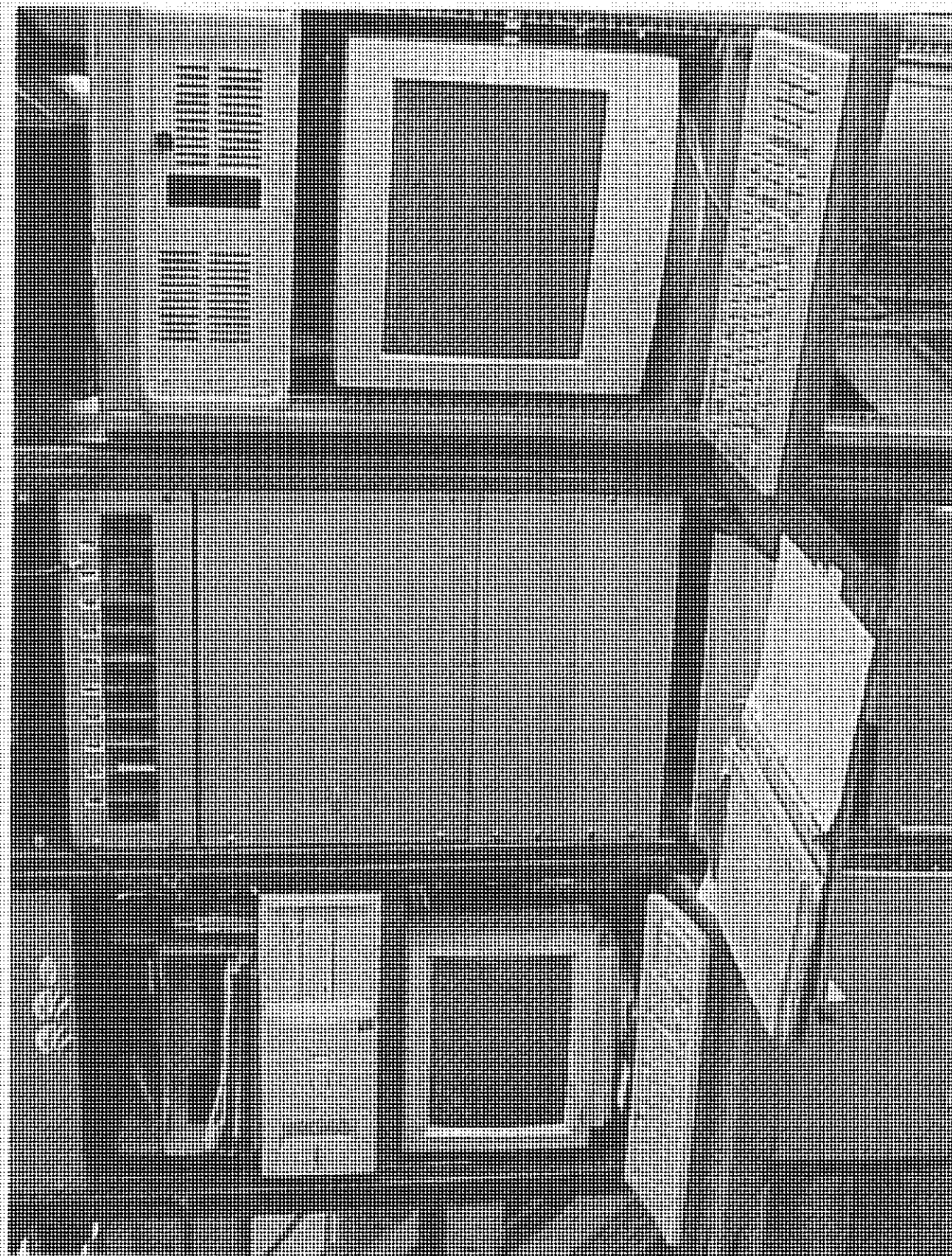
FIGURE 5-8  
VEHICLE TIRE INFORMATION LABEL



2006 CHEVROLET MALIBU  
NHTSA NO. C40102  
FMVSS NO. 214

FIGURE 5.9  
VEHICLE VIN PLATE





2004 CHEVROLET MALIBU  
NHTSA NO. C40102  
FMVSS NO. 214

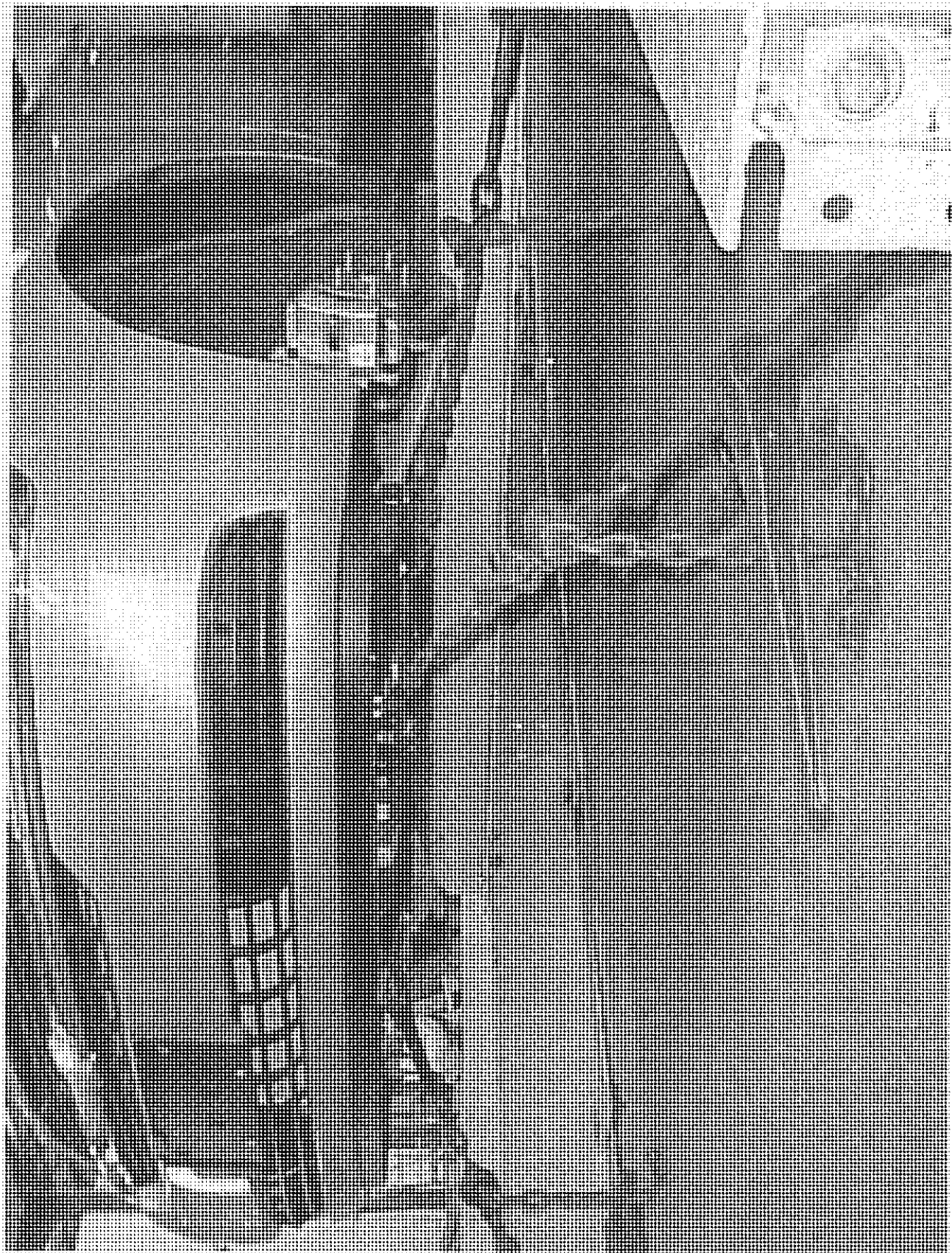
FIGURE 5.10  
INSTRUMENTATION SET-UP



2004 CHEVROLET MALIBU  
NHTSA NO. C40102  
FMVSS NO. 214

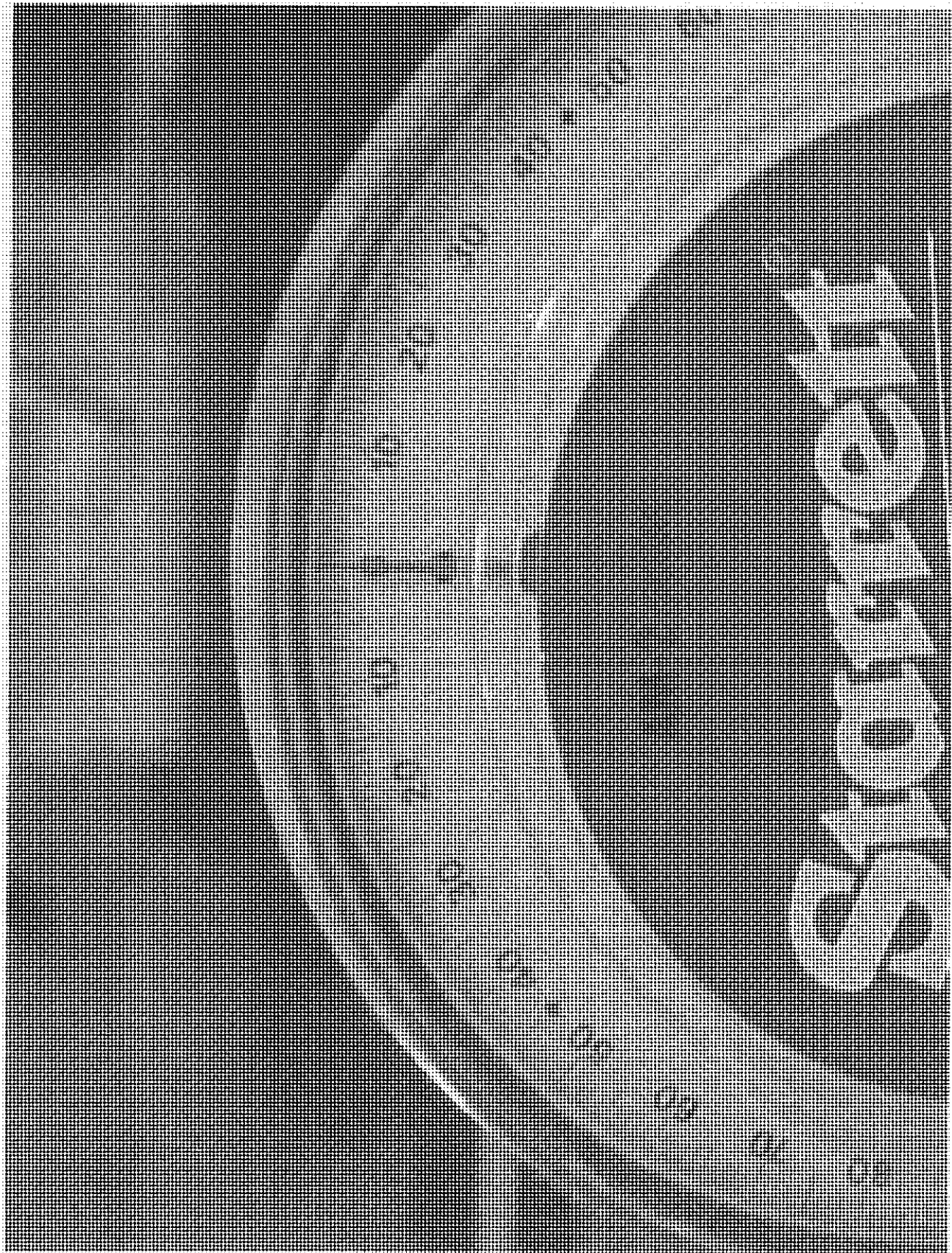
FIGURE 5.11  
REAR VEHICLE TIE DOWN - TEST 1





2004 CHEVROLET MALIBU  
NHTSA NO. C40102  
FMVSS NO. 214

FIGURE 5.12  
FRONT VEHICLE TIE DOWN -- TEST 1

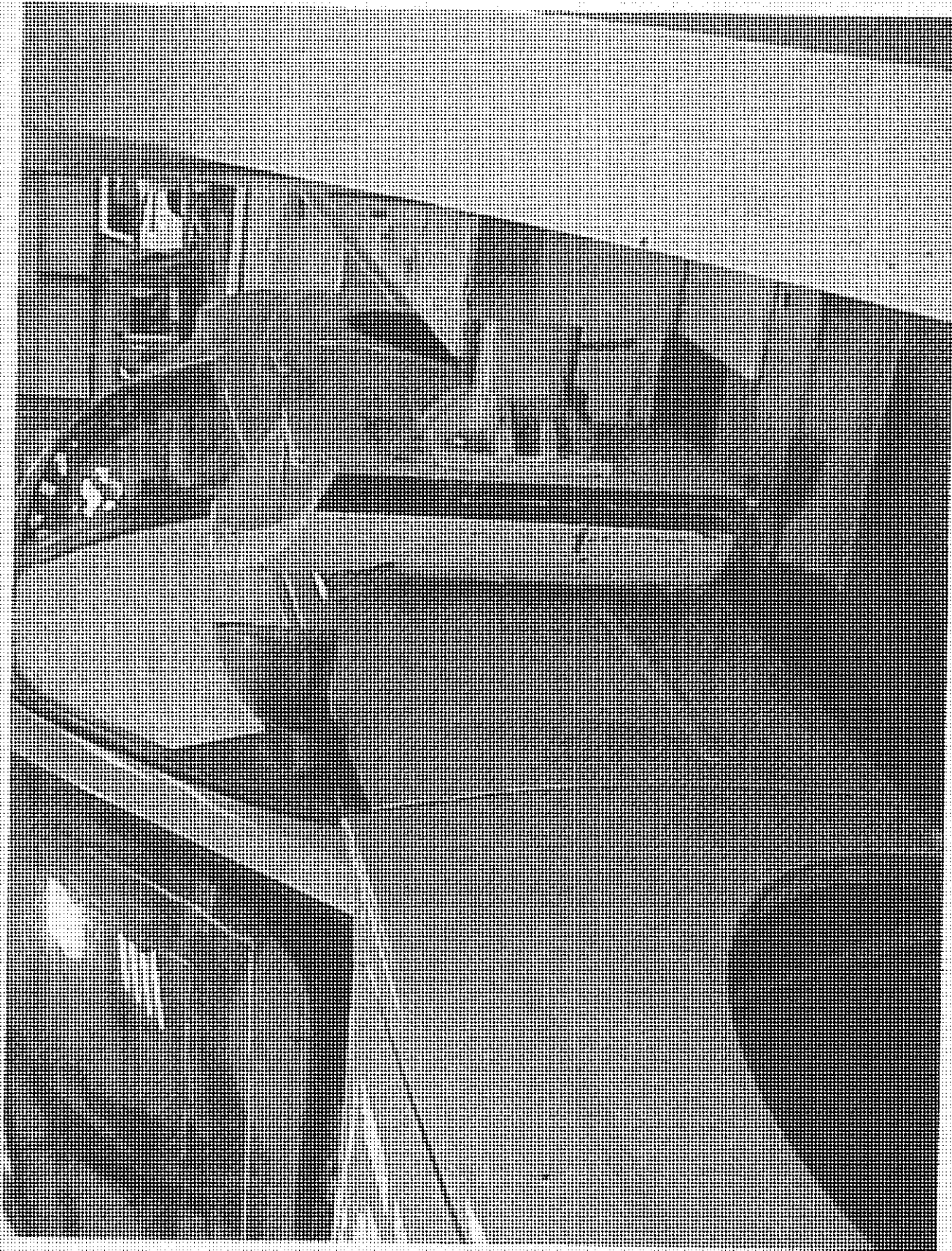


2004 CHEVROLET MALIBU  
NHTSA NO. C40102  
FMVSS NO. 214

FIGURE 5.13  
INCLINOMETER PRE-TEST 1



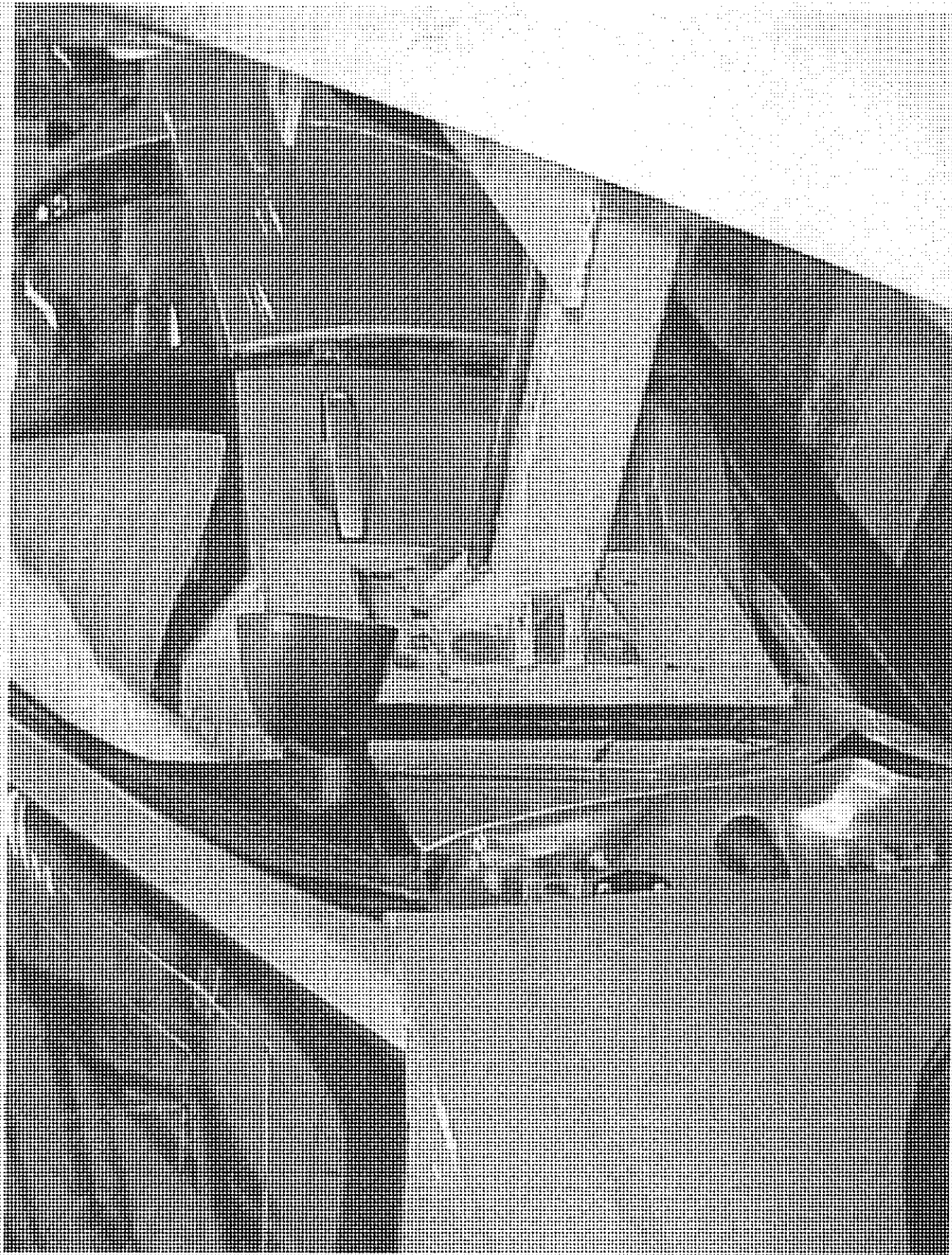




2004 CHEVROLET MALIBU  
NHTSA NO. C40102  
FMVSS NO. 214

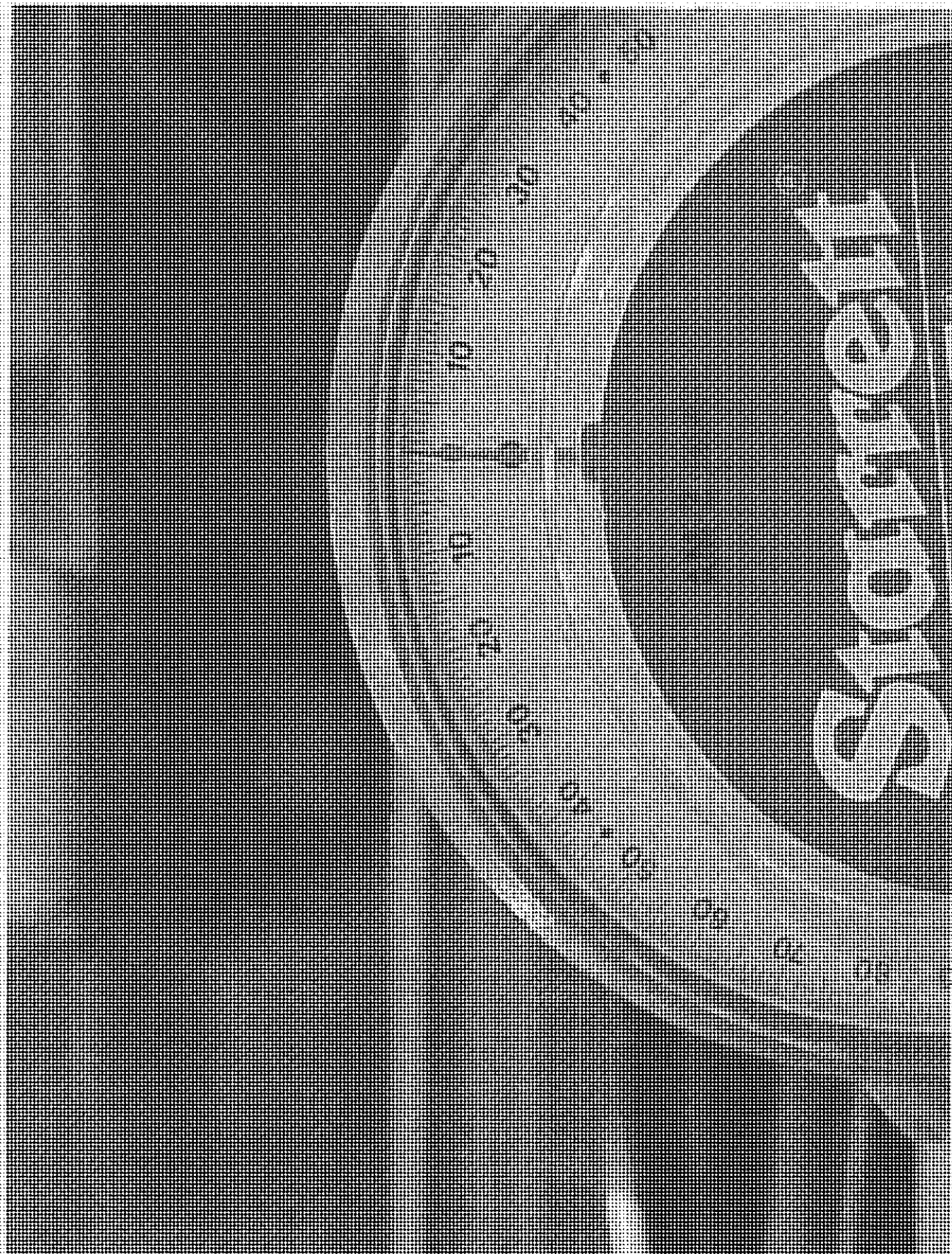
FIGURE 5.15  
LOAD DEVICE AGAINST DOOR - PRE-  
TEST 1





2004 CHEVROLET MALIBU  
NHTSA NO. C40102  
FMVSS NO. 214

FIGURE 3.16  
LOAD DEVICE AGAINST DOOR @ MAX  
LOAD - TEST 1



2004 CHEVROLET MALIBU  
NHTSA NO. C40102  
FMVSS NO. 214

FIGURE 5.17  
INCLINOMETER AT MAX LOAD - TEST 1

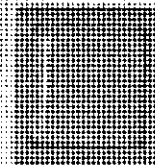


MILIBU  
INDICATOR

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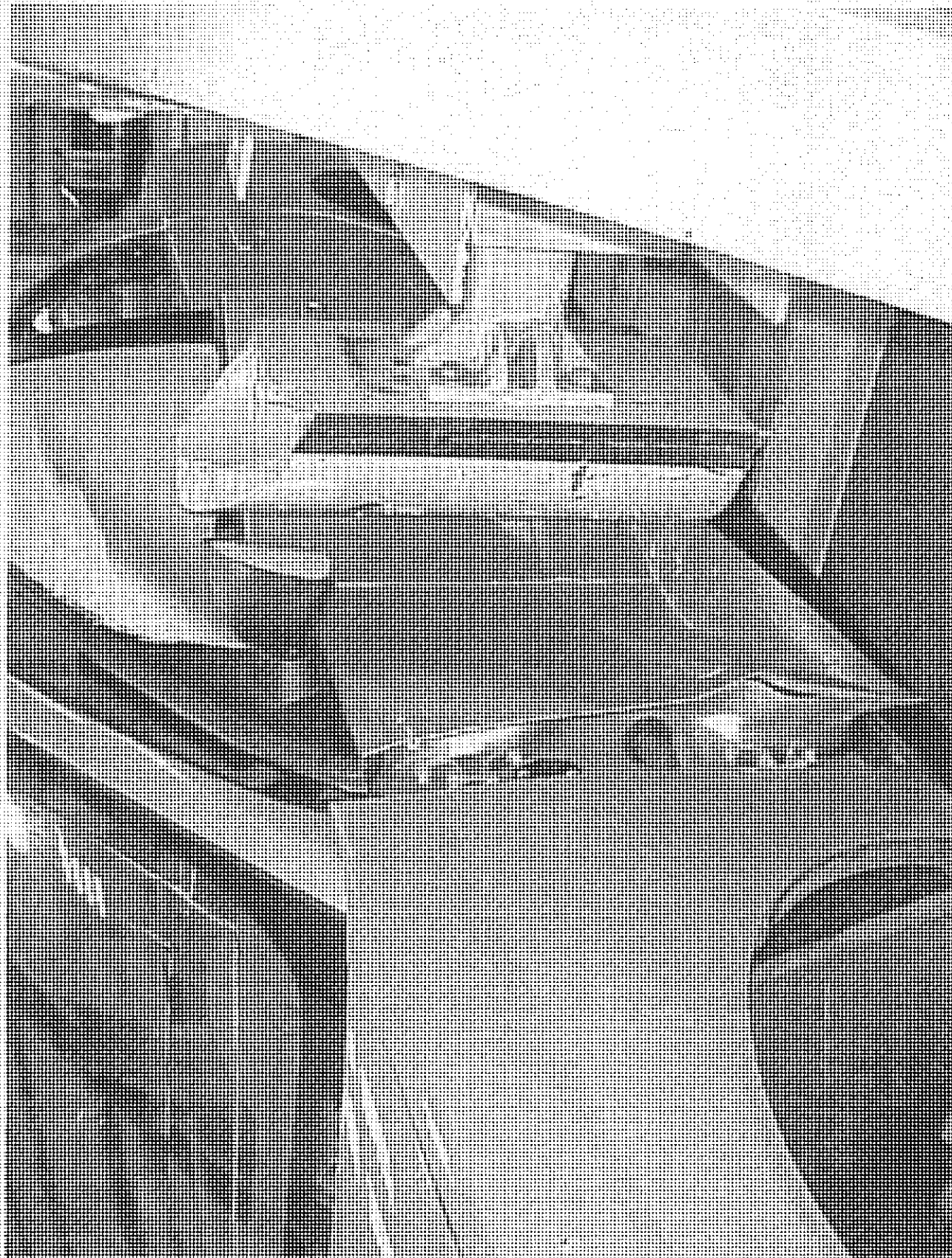
MAX IN



MODE

2004 CHEVROLET MALIBU  
NHTSA NO. C40102  
FMVSS NO. 214

FIGURE 5-18  
DIAL INDICATOR AT MAX LOAD - TEST 1



2004 CHEVROLET MALIBU  
NHTSA NO. C40102  
FMVSS NO. 214

FIGURE 5.19  
POST TEST DOOR OUTSIDE - TEST 1





2004 CHEVROLET MALIBU  
NHTSA NO. C40102  
FMVSS NO. 214

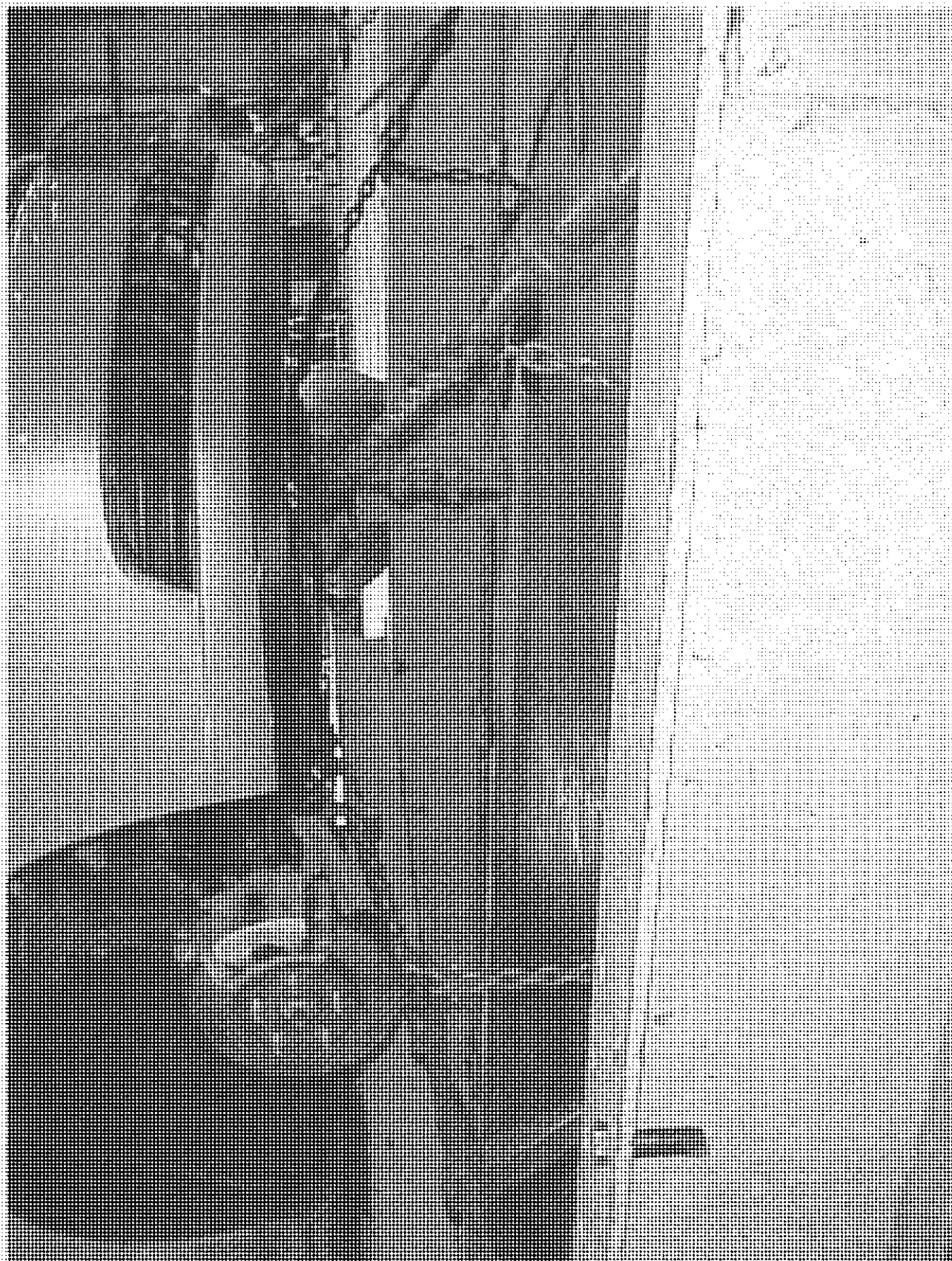
FIGURE 5.20  
POST TEST DOOR INSIDE - TEST 1



2006 CHEVROLET MALIBU  
NHTSA NO. Q40102  
FMVSS NO. 214

FIGURE 6-21  
REAR VEHICLE TIE DOWN - TEST 2





2004 CHEVROLET MALIBU  
NHTSA NO. C40102  
FMVSS NO. 214

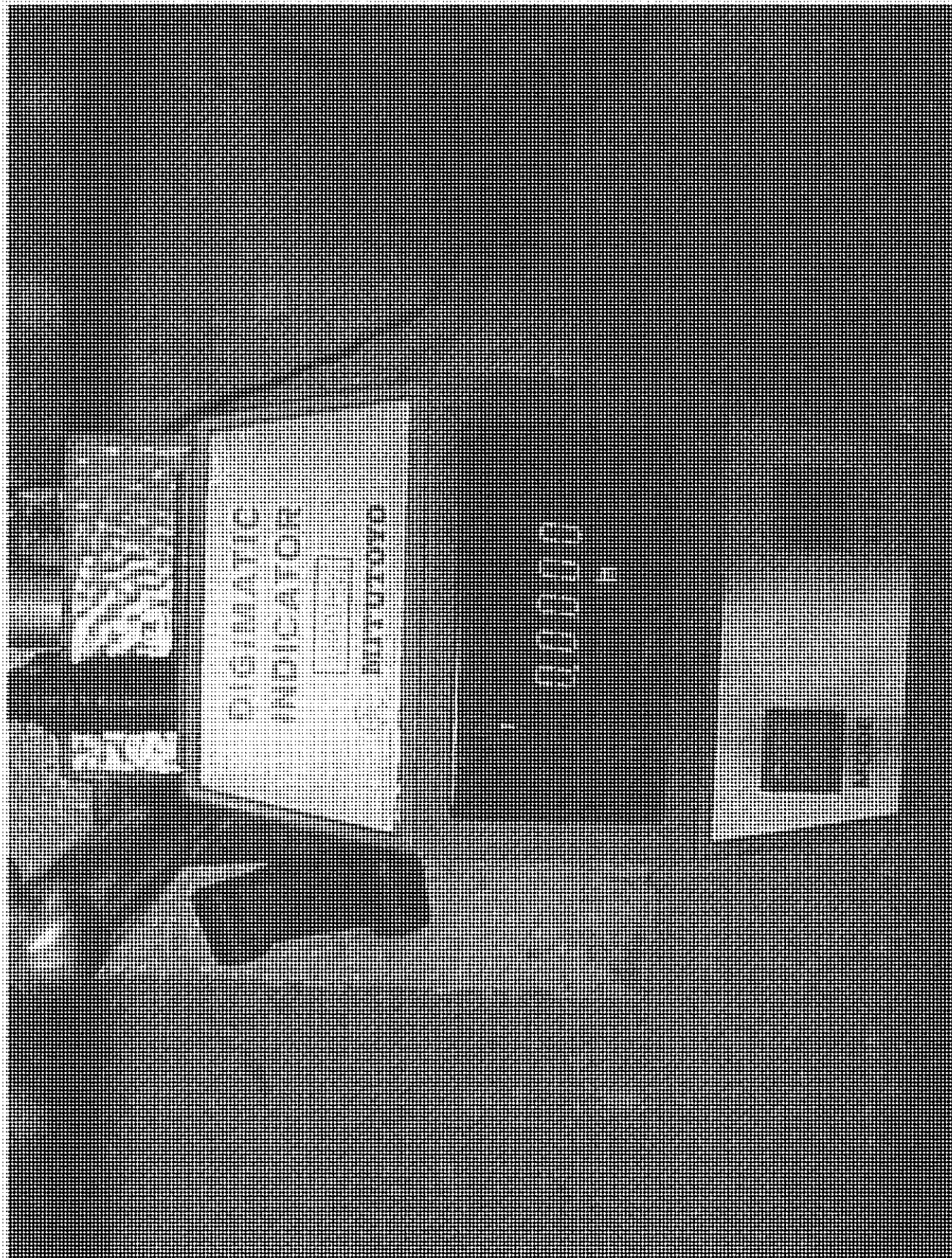
FIGURE 5.22  
FRONT VEHICLE TIE DOWN TEST 2



2004 CHEVROLET MALIBU  
NHTSA NO. C40102  
FMVSS NO. 214

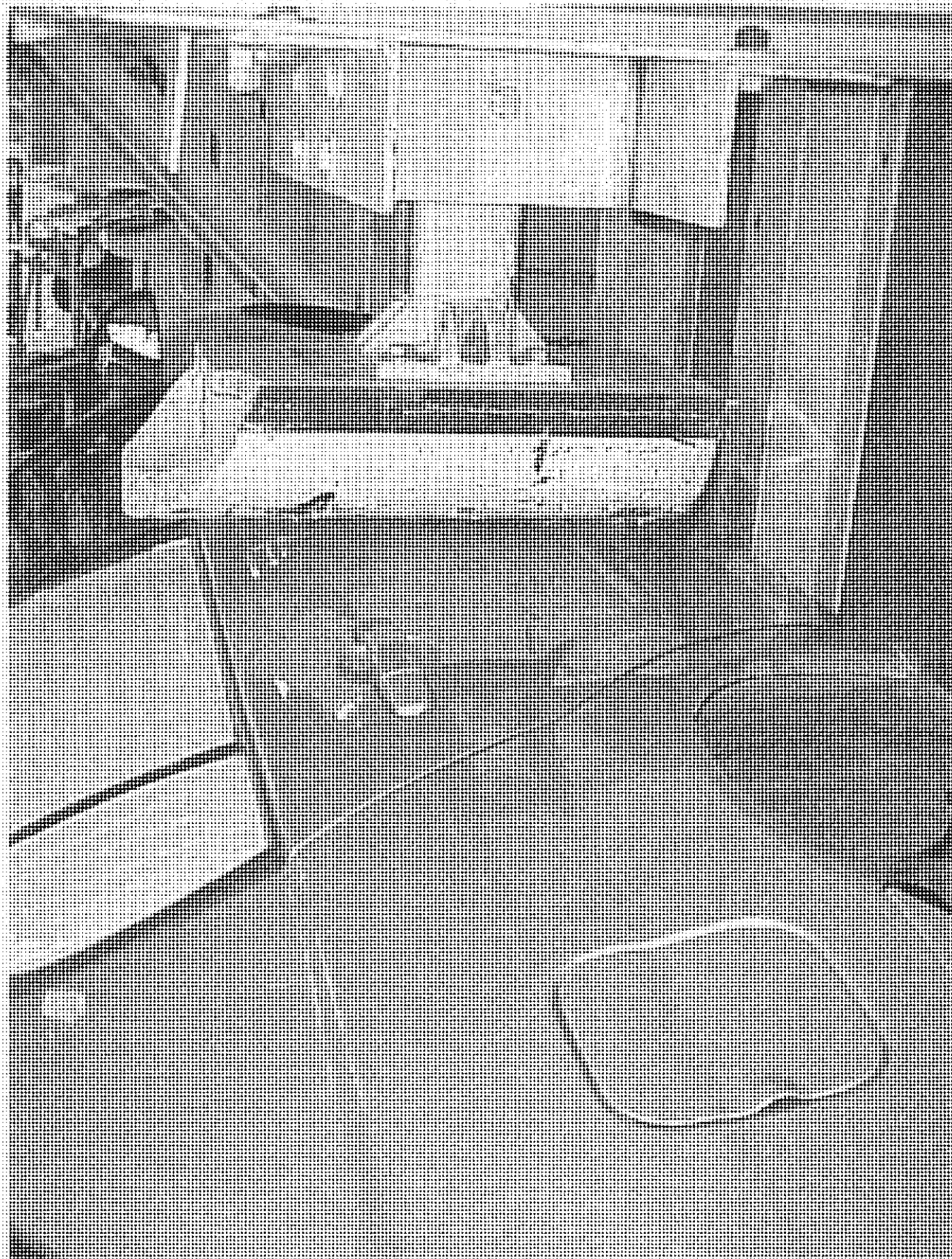
FIGURE 5.23  
INCLINOMETER PRE-TEST 2





2004 CHEVROLET MALIBU  
NHTSA NO. C40102  
FMVSS NO. 214

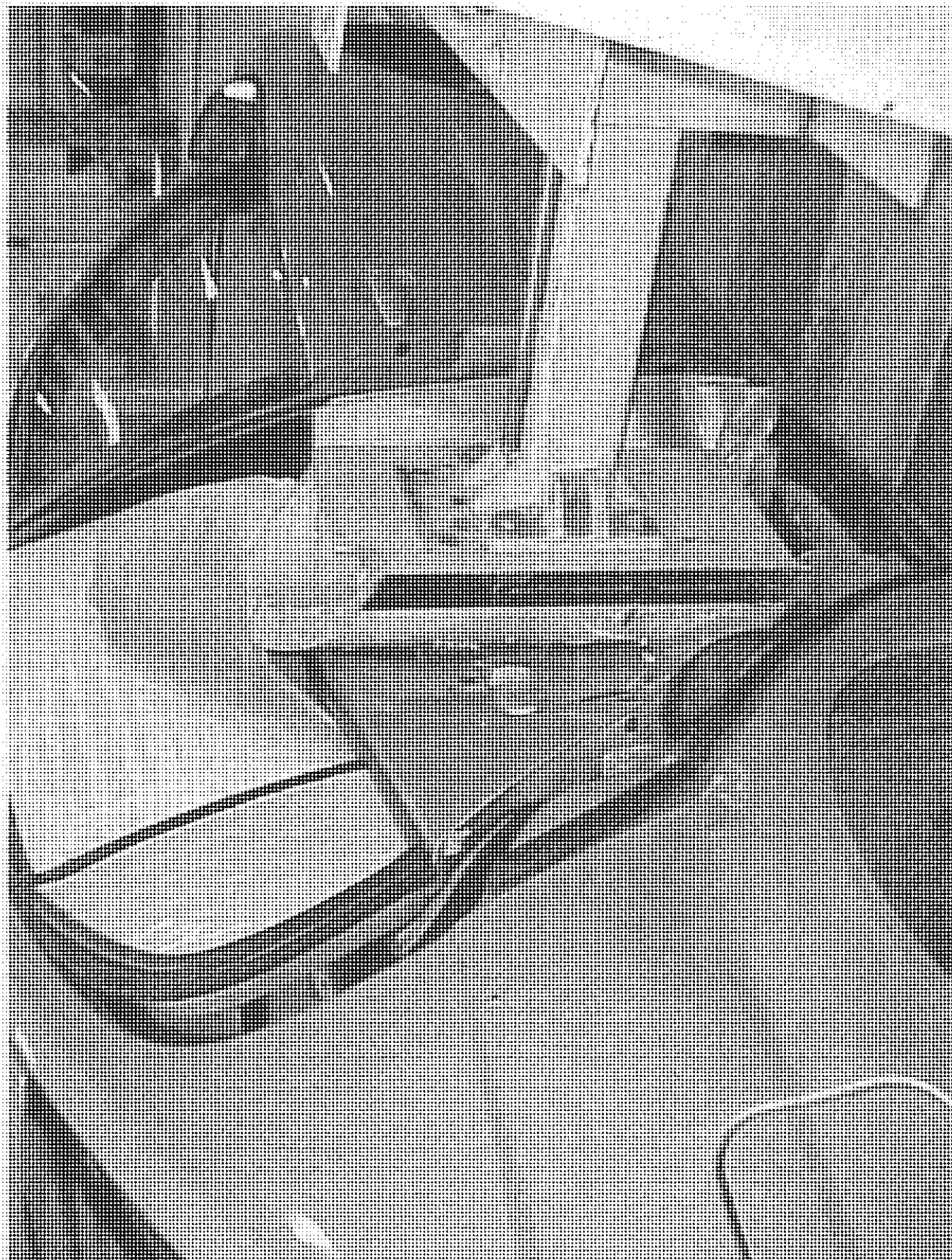
FIGURE 5.24  
DIAL INDICATOR PRE-TEST - 2



2004 CHEVROLET MALIBU  
NHTSA NO. C40102  
FMVSS NO. 214

FIGURE 5.25  
LOAD DEVICE AGAINST DOOR - PRE-  
"TEST" 2





2004 CHEVROLET MALIBU  
NHESA NO. C40102  
FMVSS NO. 214

FIGURE 5.26  
LOAD DEVICE AGAINST DOOR @ MAX  
LOAD - TEST 2



2004 CHEVROLET MALIBU  
NHTSA NO. C40102  
FMVSS NO. 216

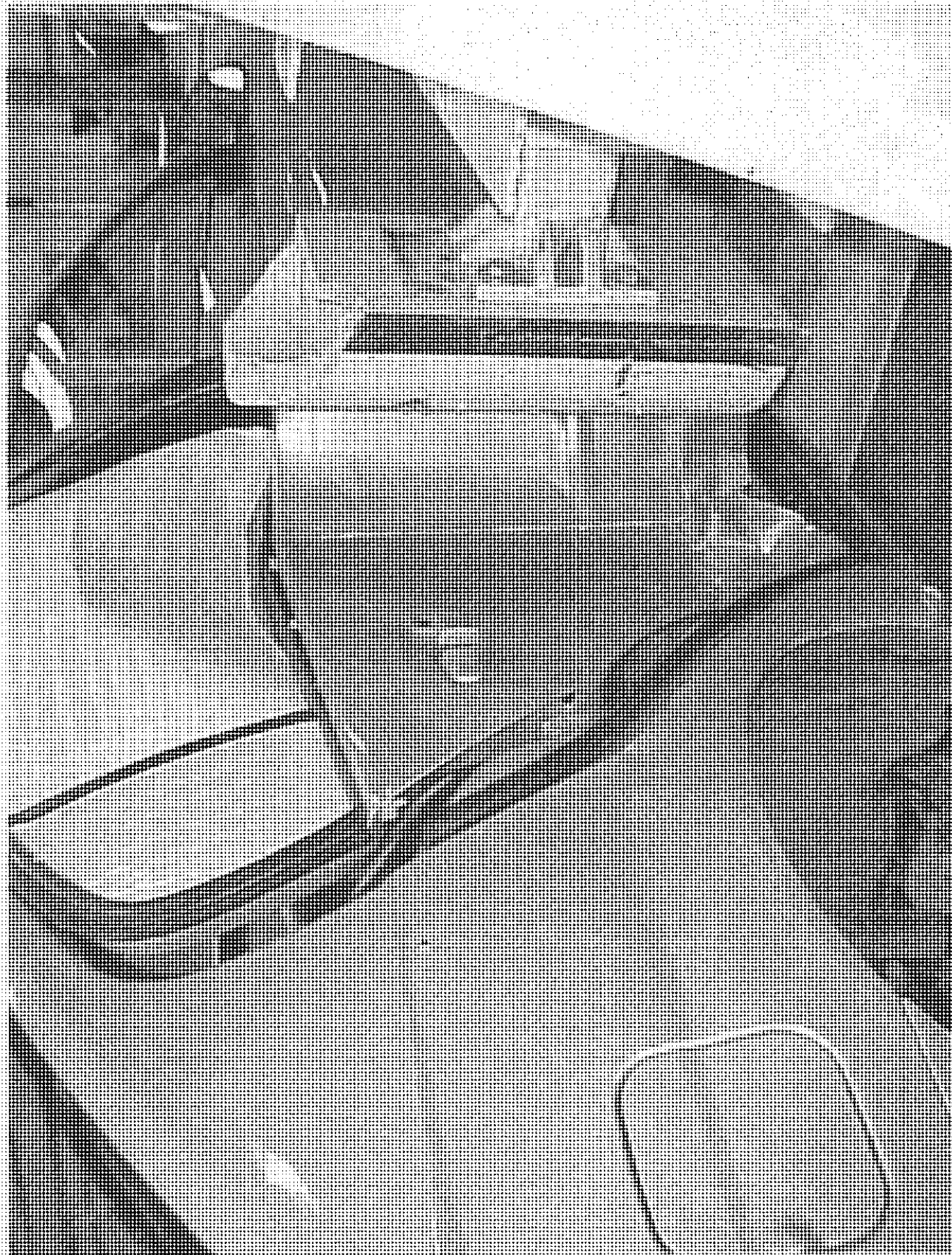
FIGURE 5.27  
INCLINOMETER AT MAX LOAD - TEST 2





2004 CHEVROLET MALIBU  
NH TSA NO. C40102  
FMVSS NO. 214

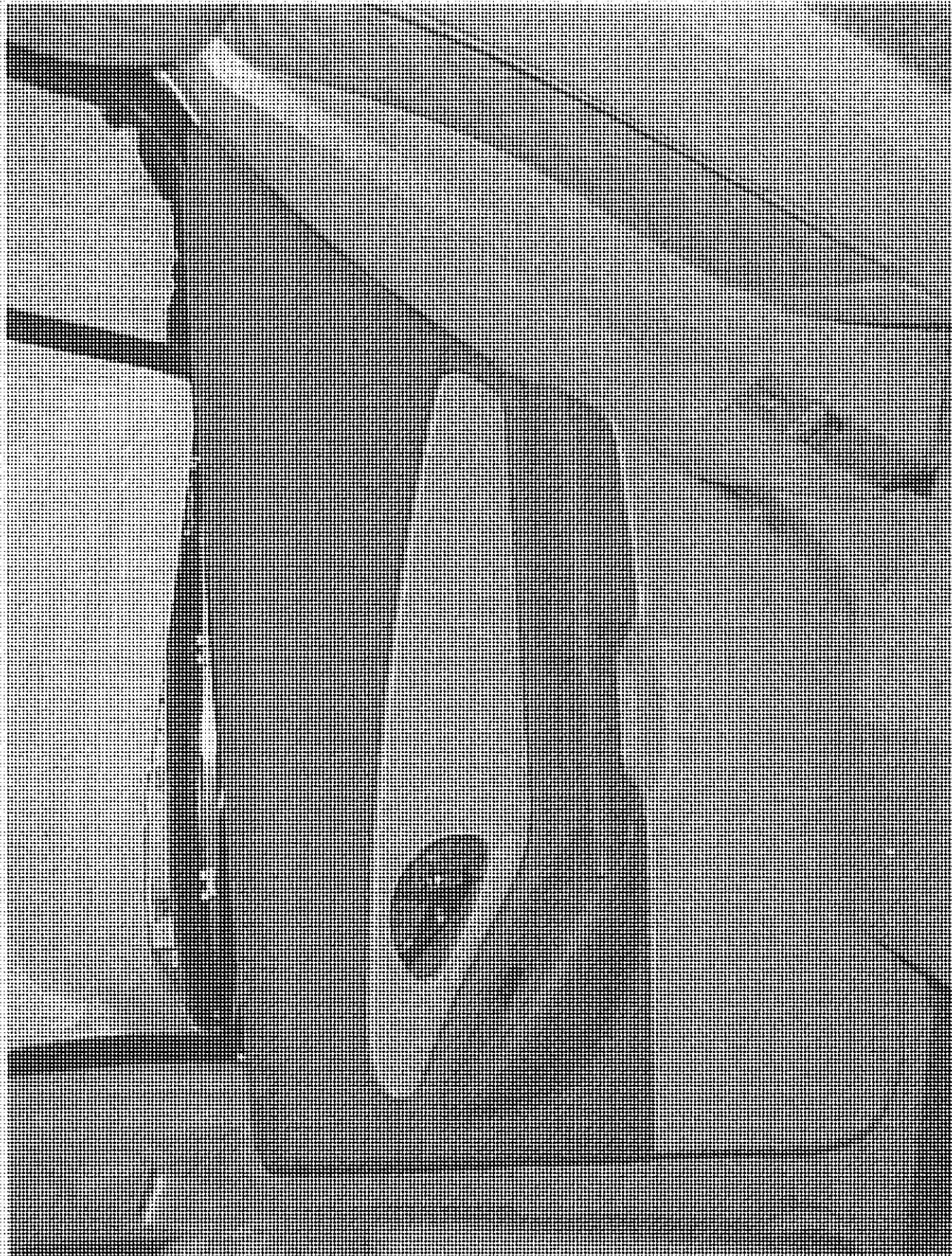
FIGURE 5.23  
DIAL INDICATOR AT MAX LOAD - TEST 2



2004 CHEVROLET MALIBU  
NHTSA NO. C40102  
FMVSS NO. 214

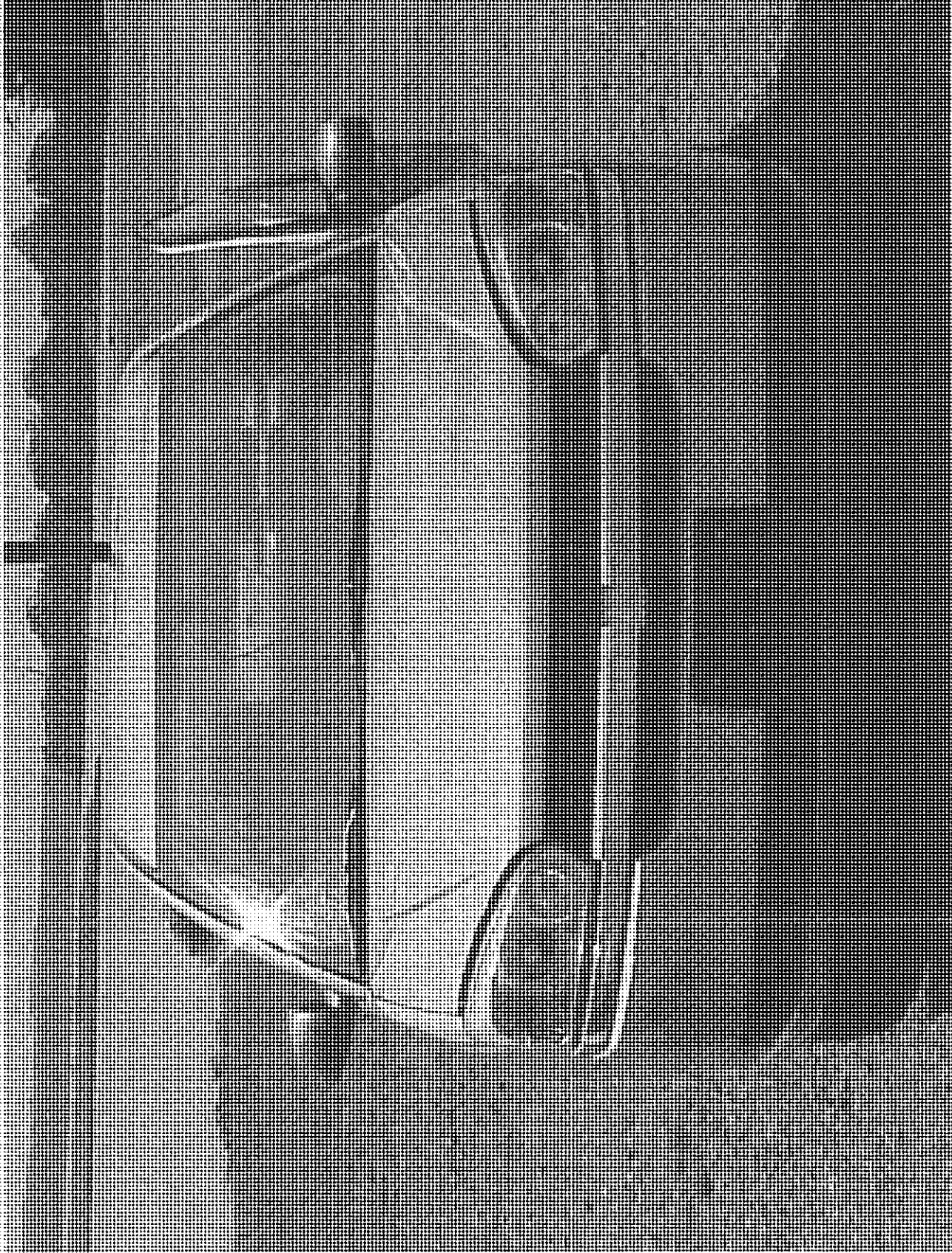
FIGURE 5.29  
POST TEST DOOR OUTSIDE - TEST 2





2004 CHEVROLET MALIBU  
NEHTSA NO. C40102  
FMVSS NO. 214

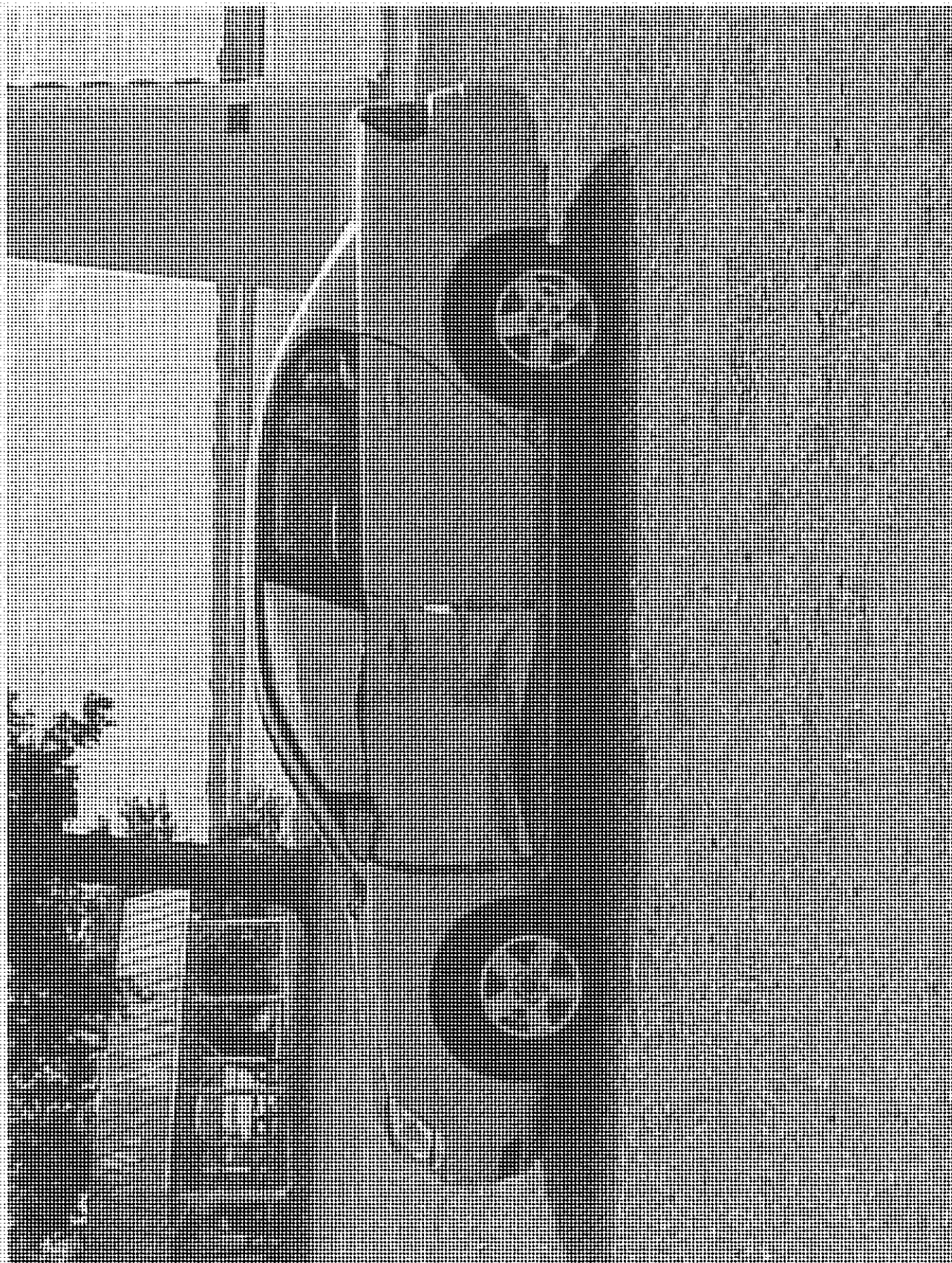
FIGURE 5.30  
POST TEST DOOR INSIDE - TEST 2



2004 CHEVROLET MALIBU  
NHTSA NO. C40102  
FMVSS NO. 214

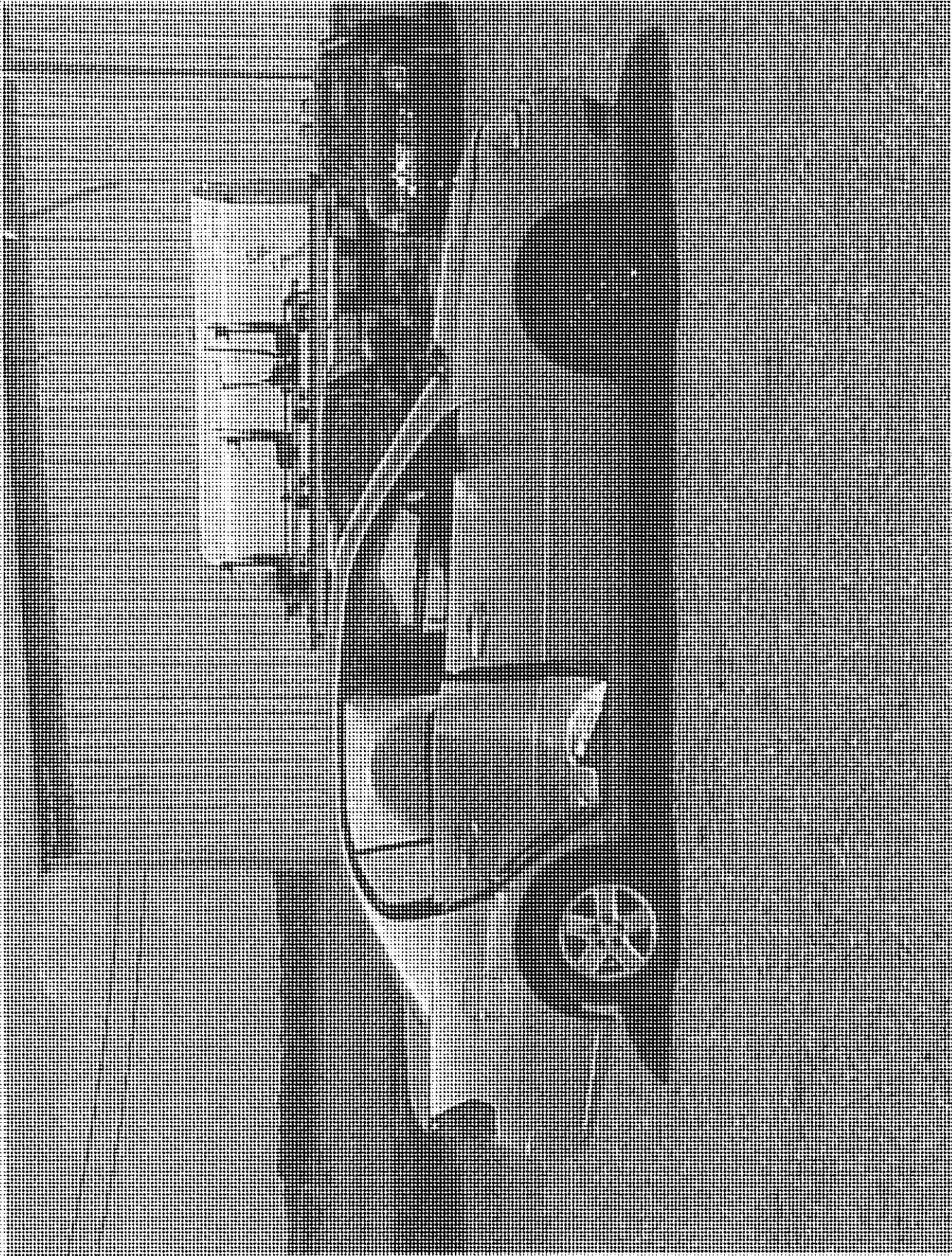
FIGURE 6-31  
FRONT VIEW OF VEHICLE POST TEST





2004 CHEVROLET MALIBU  
NIHTSA NO. C40102  
FMVSS NO. 214

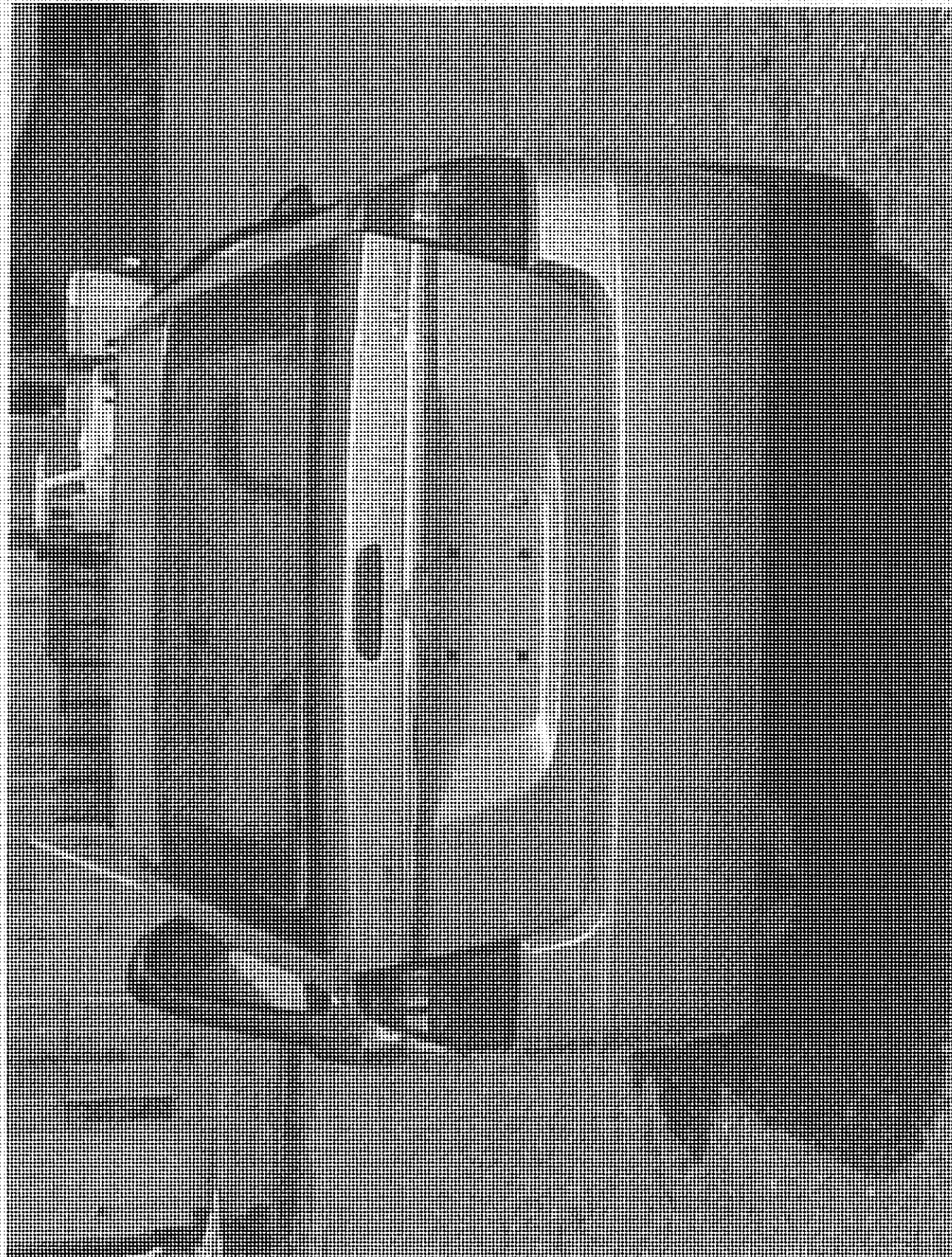
FIGURE 5.32  
LEFT SIDE VIEW OF VEHICLE POST TEST



2004 CHEVROLET MALIBU  
NHTSA NO. C40102  
FMVSS NO. 214

FIGURE 5.35  
RIGHT SIDE VIEW OF VEHICLE POST  
TEST

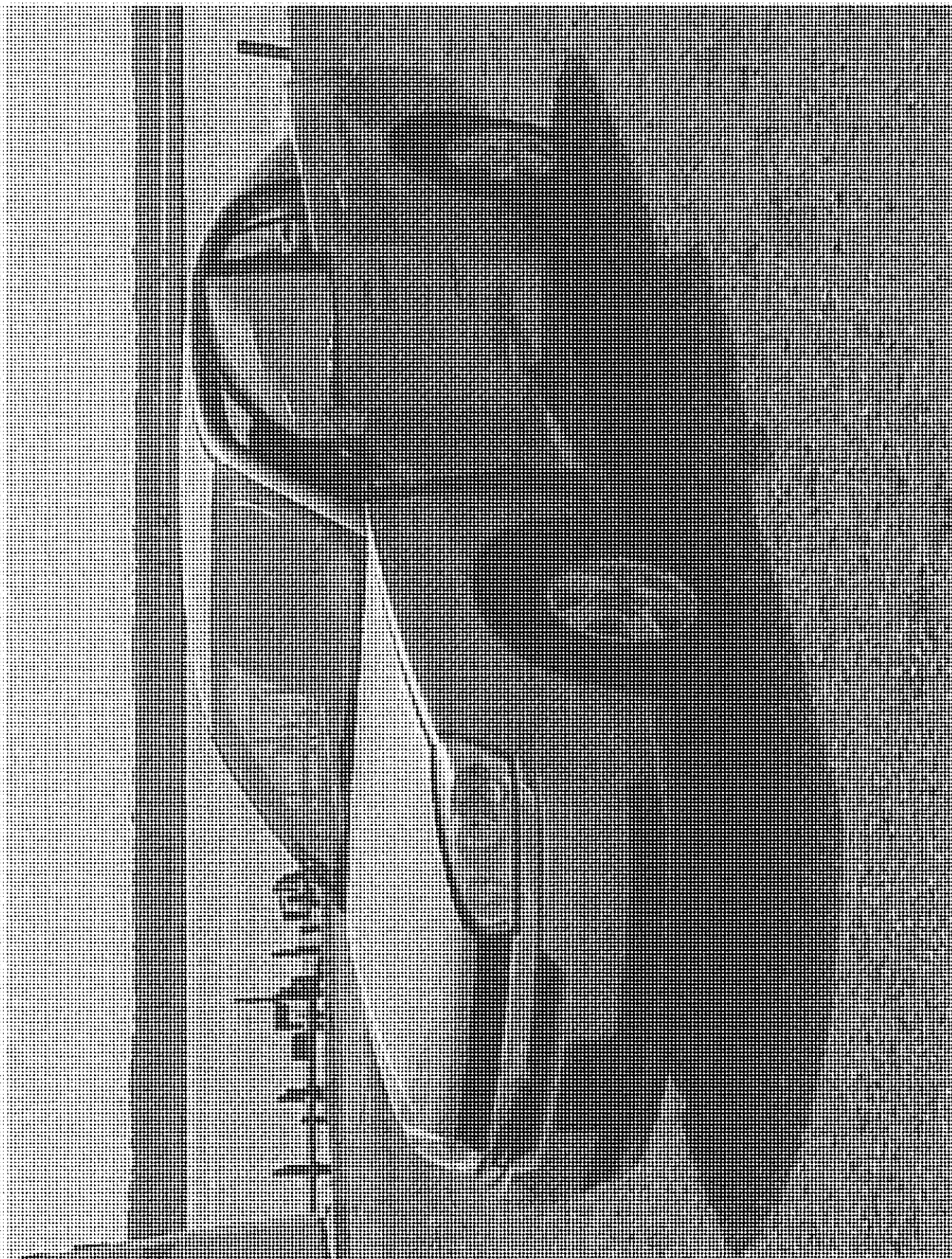




2004 CHEVROLET MALIBU  
NHSTA NO. C40102  
FMVSS NO. 216

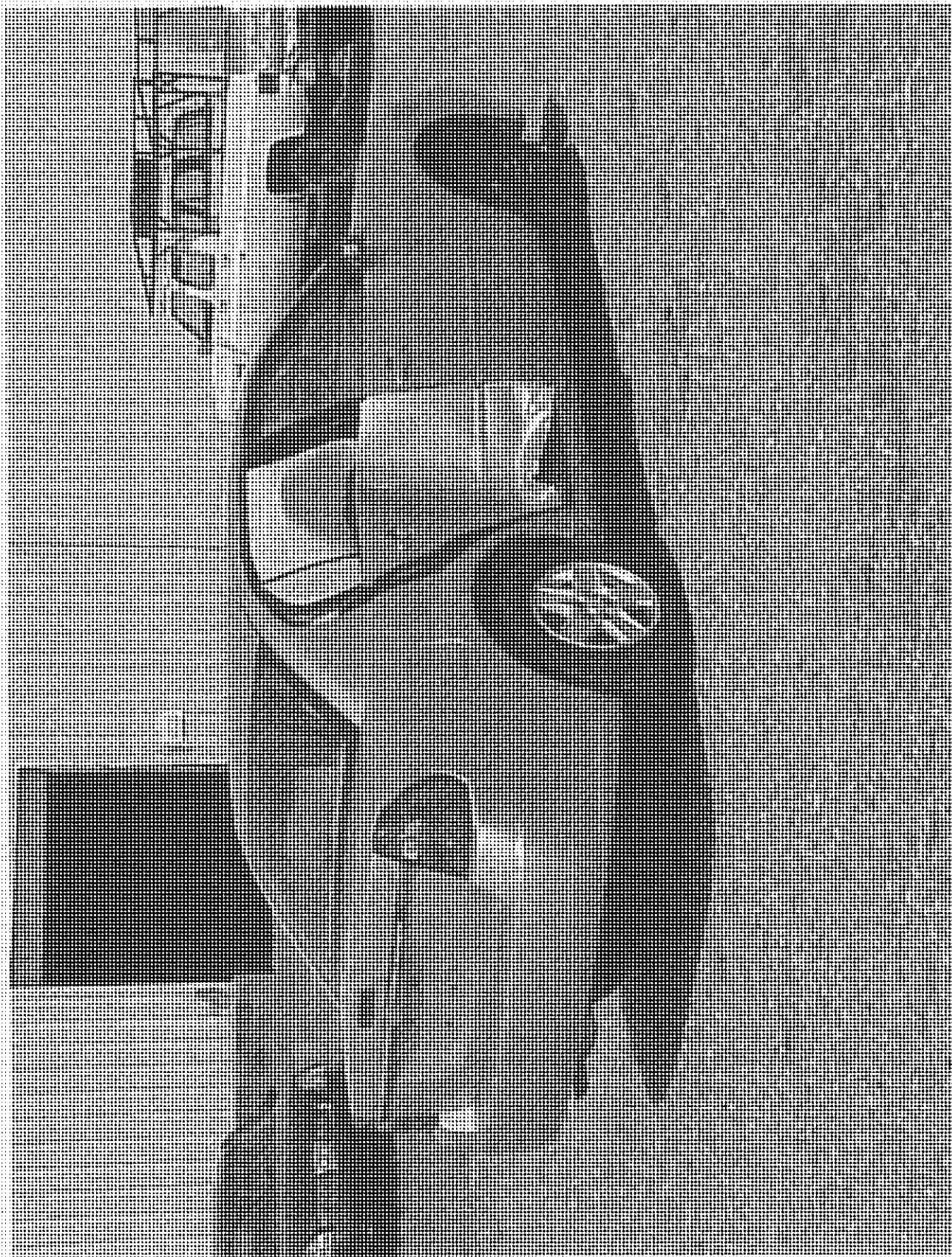
FIGURE 3.34  
REAR VIEW OF VEHICLE POST TEST





2004 CHEVROLET MALIBU  
NHTSA NO. C40102  
FMVSS NO. 214

FIGURE 3-35  
¾ FRONTAL VIEW FROM LEFT SIDE OF  
VEHICLE POST TEST



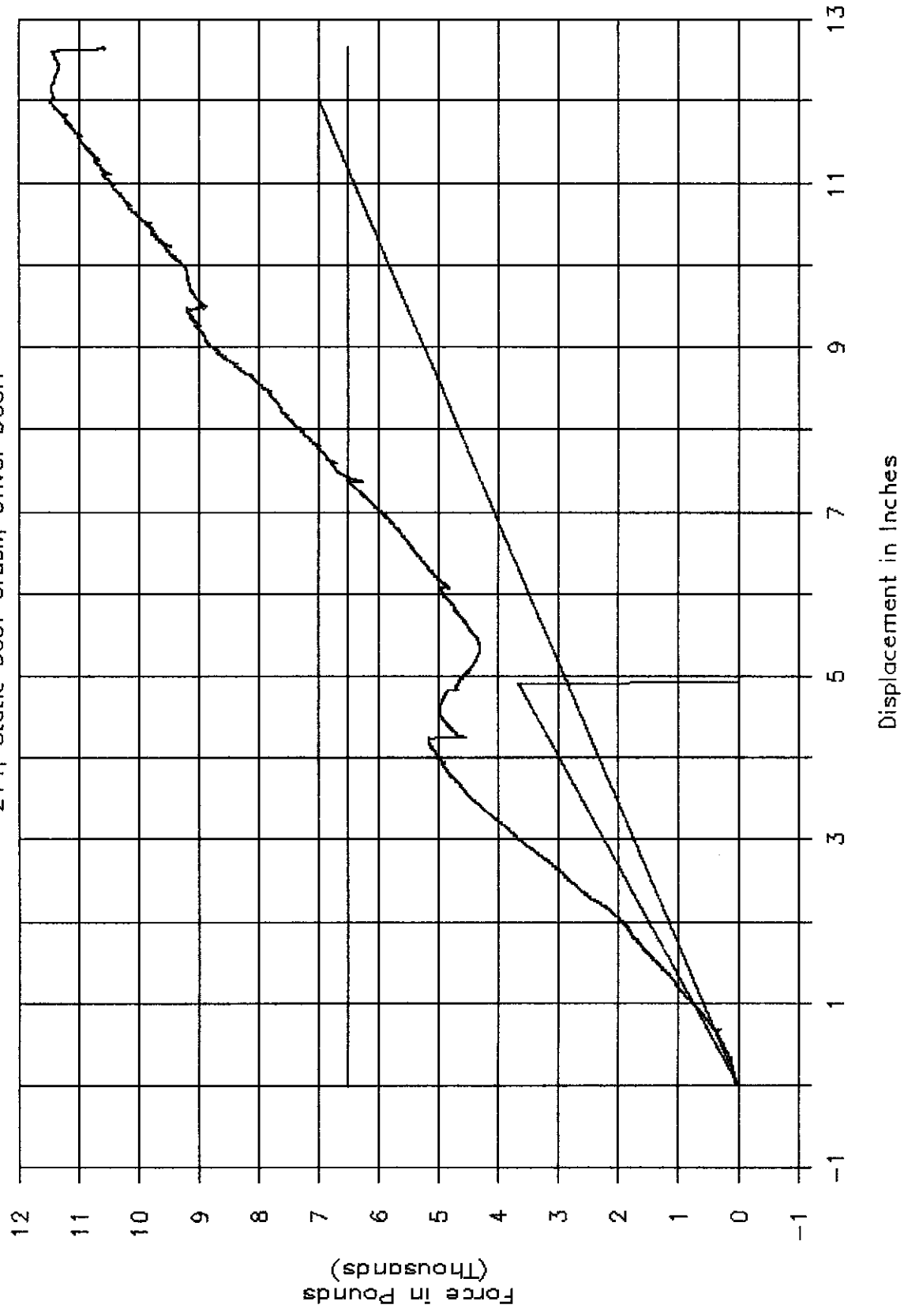
2004 CHEVROLET MALIBU  
NHTSA NO. C40102  
FMVSS NO. 214

FIGURE 5.35  
¾ REAR VIEW FROM RIGHT SIDE OF  
VEHICLE POST TEST

SECTION 6  
TEST DATA PLOTS

GTL 5246, NHTSA C40102.

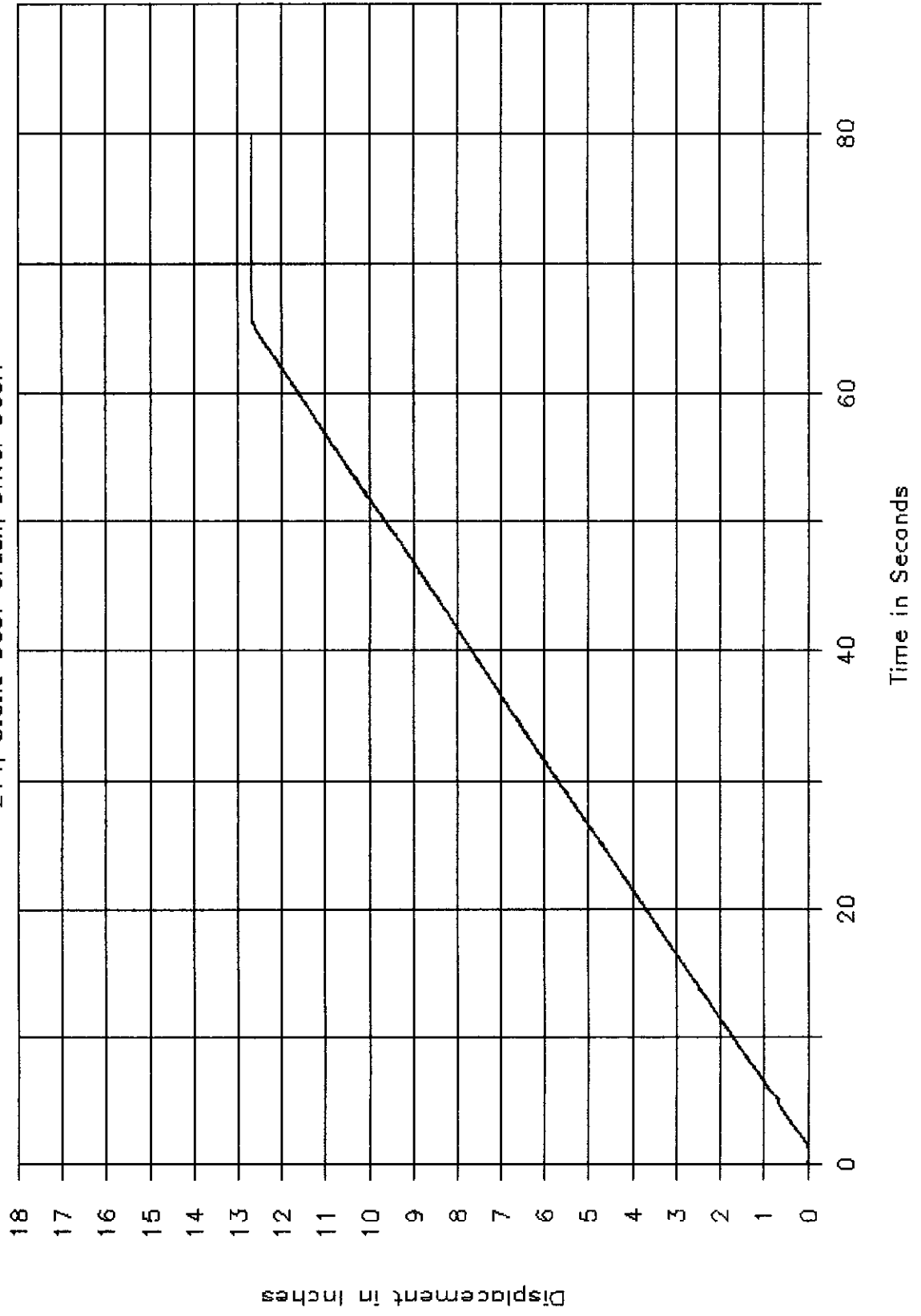
214, Static Door Crush, Driver Door.





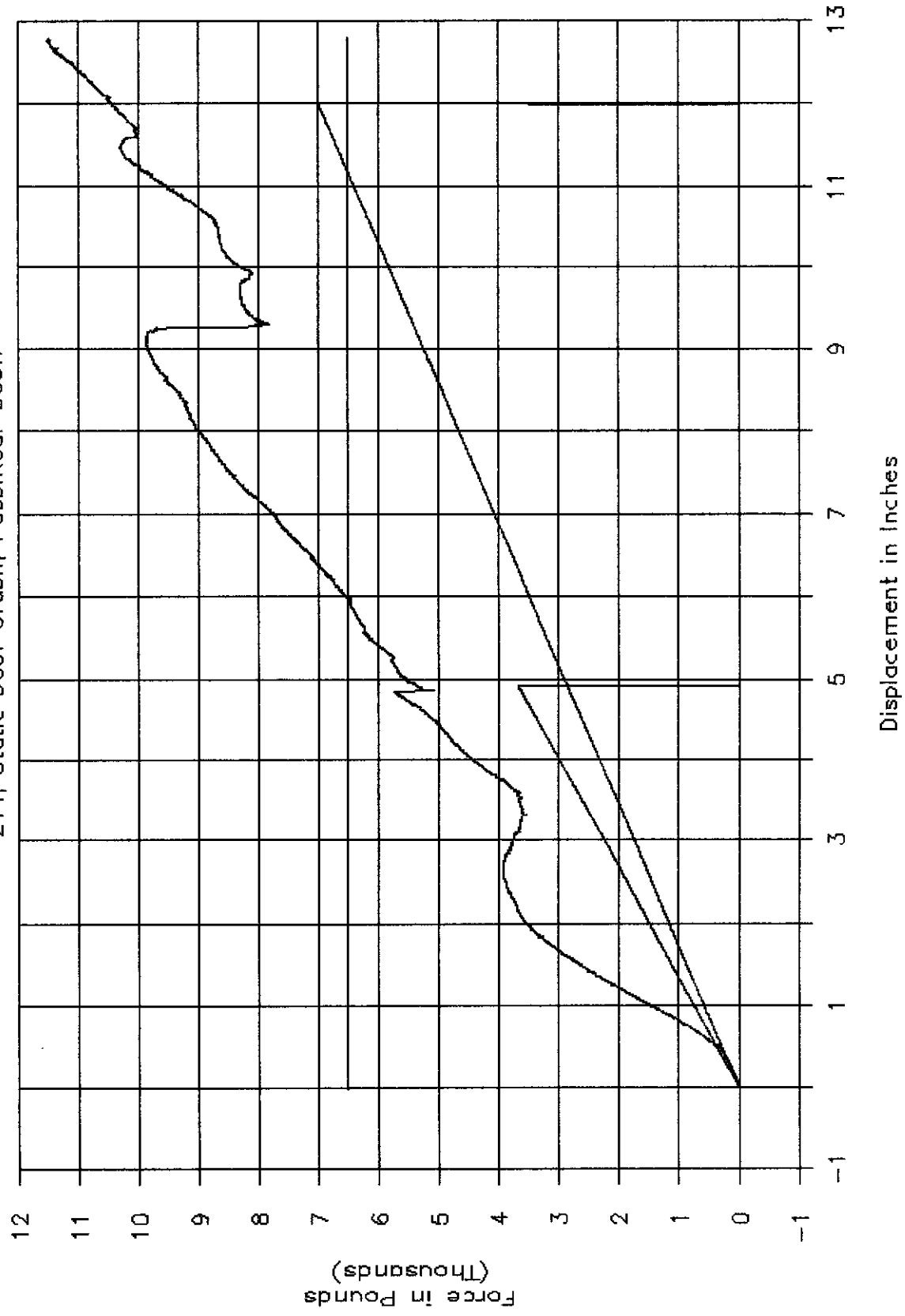
# GTL 5246, NHTSA C40102.

214, Static Door Crush, Driver Door.



GTL 5247, NHTSA C40102.

214, Static Door Crush, Pass.Rear Door.



GTL 5247, NHTSA C40102.

214, Static Door Crush, Pass.Rear Door.

